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VOL. XVI MARCH, 1933 No. 3

THE COST OF MEDICAL CARE. WHY WAS THE SURVEY MADE? WHAT RESULTS WERE EXPECTED FROM THE SURVEY?*

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IN outlining what I believe to be the social aspects of these two important questions, my object is to suggest certain points of view that may be useful. It is a case of "The sociologist looks at medicine," to paraphrase a familiar title.

Why was this survey made? It was made to discover the main facts and the scope of the crisis that now faces the medical profession. As you all know, this crisis is not a mere "psychological" crisis. It is a grim and realistic situation. The report of the Committee shows that this crisis consists of a fundamental economic and social dislocation within the fields of medicine and public health. On the one hand, it is a demonstrated fact that the great middle classes of American society, particularly those portions that live in rural regions and in small communities, do not have available adequate medical service. On the other hand, it is a demonstrated fact that thousands of physicians, dentists, and nurses receive incomes that are below the reasonable minimum to which their long training and the costly investment in preparation entitle them. So much for a brief answer to the first question.

What results were expected from the survey? It was hoped that the findings of the survey would provide the basis for formulating a plan whereby the medical profession could avoid these two chief dangers in the present crisis. In my opinion the report does suggest a constructive plan that is in the main consistent with the best judgment of social scientists. So much for a brief answer to the second question. Let me now be more specific and attempt to interpret to you the meaning of the present social trends that affect the crisis and set limitations on any constructive plans to cope with it.

In the first place the reports of the majority and of the minorities of the Committee contain enormous quantities of facts gathered over a period of five years by scores of competent medical and lay people at a cost of $1,500,000. No such exhaustive study of medical care has ever been carried to completion by any other nation at any other time in history. The findings and opinions of the reports thus contain the most impressive body of evidence as a basis of planning that has been ever available to the medical profession. Furthermore, the composition of the Committee is so widely representative of different groups as to preclude provincialism and narrow bias. Financial support was supplied by eight national foundations and two other organizations. Parenthetically, I wish to say that Dr. Fishbein's editorial reference[1] to the part played by Mr. F. A. Filene through the financial support of the Twentieth Century Foundation sounds to me like an exaggeration, since the contribution of this foundation was but a small fractional part of the hundreds of thousands of dollars spent. For all these reasons I commend your deliberate and careful study of the entire mass of this factual evidence before you condemn officially either the majority or the minority reports.[2] As a sociologist who is familiar with the task of working over great masses of

*Presented at the Conference to discuss the Majority Report of the Committee on the Costs of Medical Care, under the auspices of the Minnesota State Medical Association, Minneapolis, December 18, 1932.

factual data and statements of conflicting inference and opinion, I consider that these reports fully justify the time and expense in making them.

What the committee tried to do and what it has done is to present a challenge to the American people as well as a summons to the medical profession to give an accounting! Judging by what I hear and by what I have read the medical profession appears to be aroused. I hope that this is true, since, if true, it shows that you are in a healthy emotional condition. No profession or group can maintain itself in this changing world if it complacently persists in obsolete forms of social organization. All about us today is the wreckage of banks, business firms and other enterprises, whose leaders were complacent yesterday and followed outworn forms of business organization to a certain doom. If the medical profession rises to this challenge of a new social system it can set its house in order. I regard the reports of the Committee on the Costs of Medical Care, both majority and minority reports, as an indictment of the present social organization of medical care. But these reports are more than an indictment, they are constructive in advocating a planned social organization of medical care to take the place of the existing competitive system with its isolated efforts, its aimless individual strivings, and its inevitable and costly conflicts. Sociologically considered, the crisis in medical care is in no small degree due to a combination, reinforcement and facilitation of countless individual forces in an unguided competitive society. Since we are all human it is difficult for us to see the major combinations of forces at work in the other fellows' province. Let me therefore take some examples from the other fields of human activity.

Considered as individual members of a profession you are like individual business men, bound up in a competitive chaos (often miscalled a competitive system). In the field of business enterprise this competitive chaos spread over the entire civilized world during the past century. The results of unplanned business enterprise are today known to all of you in the present world-wide depression. It would be possible to present to you the facts of labor turnover, unjustified capital investment, wrong marketing organization, inefficient and stupid management policies, which, in concrete case after case, demonstrate the inevitable outcome of individual effort conducted without regard to changing combinations of factors in the business world, or without regard to long-term planning. All questions of business ethics and service aside, we now know that there are elemental economic and social forces of an irresistible sort, which, when set in motion in an unguided competitive society, gather headway and sweep before them all obstacles, sucking into the maelstrom alike the deserving and the undeserving, until the crash comes and is followed by a long and painful process of liquidation. This was the case of the great bull market of 1929. Thousands of people speculated; competed among themselves wildly for ownership of securities until prices were far in excess of values and the bubble burst. Turn for a moment to another example of the same principle. I refer to the war debts situation. During the period 1918 to 1930 the United States consistently sold more goods in foreign markets than it purchased and yet foreign governments managed to pay their debts to us. Why didn't this happy process continue? Why are the nations now defaulting? The secret has at last leaked out. Private and individualistic American investors, unregulated and unguided, advanced new loans to Europe. Foreign nations merely used American money to repay American war debts as well as to purchase American goods. Thus we deceived ourselves as to the true situation. We had been merely taking money from one pocket and putting it in another pocket via foreign nations. When the real situation was discovered we stopped our foreign loans, and presto, foreign nations stopped paying their debts to us. Again, the millions of discontented feelings of our distressed people welled up, and in the enormous popular vote of 1932, swept out of office an entire political regime. Gentlemen, we are dealing also with great social, economic and political forces when we discuss this problem of medical care in an age of educated people and swift means of communication and transportation.

In the business field we have too many stores, too many factories, too many railroads, and too many farms. We have overproduced the articles and machinery with which to produce more of all these things. Meanwhile out antiquated organization for distribution cannot cope with shrinking markets and there is poverty and

want in the midst of plenty. Now it is no far-fetched analogy to the situation of medical care. We know and are proud of the rapid increase in medical knowledge. But we have produced more medical knowledge than we seem to be able to apply. There is a decided lag in the application of medical knowledge to the needs of the public. In short, our capacity of production has overextended itself as tested by our organized capacity to distribute the benefits of this knowledge. There is a maladjustment between the rapidly accumulating knowledge of specialists and the needs of the people for medical care. There are too many medical personnel in large cities and too few in the country and small communities. Both the majority and the minority reports agree that there are too few general practitioners and too many specialists. Like the maladjustment of supply and demand in the economic world, there is a dislocation between medical care and human need in the social world. And both maladjustments are in considerable measure due to the unguided activities of thousands of well-meaning individuals acting in a blind competitive effort without adequate perspective of the whole process. No single remedy for so complex a process is possible. The etiology is winding and tortuous and the treatment must be varied and experimental. Since in my opinion the causal factors are primarily economic and social, the treatment cannot, in my opinion, be individual, as the first minority report seems to contend. It must be social. What I mean is, that the remedies lie in adjusting and improving the social organization of medical care.

This observation leads me at once to an effort to interpret the recommendations of the Committee on the Costs of Medical Care. My opinion is that the reports of the Committee, especially the majority report, *set up for your consideration the principle of planned organization of medical services from the point of view of a survey of the whole process.* The Committee report forsakes once for all the obsolete laissez-faire idea of a blind struggle for existence and turns to the idea of rational organization that attempts to accommodate and guide the direction of the development of medical care in consideration of the major forces at work. As one who has had some practical experience in social planning and then in putting these plans into application, I regard the recommendations of the majority report, not as utopian and visionary, as Dr. Fishbein would have you believe, but as plans that embody the teachings of practical experience.

I interpret the first recommendation of the committee advocating group medicine as the outline of a plan that attempts to strike boldly at the economic and social factors that lie back of the present crisis. Observe, please, that the recommendation says medical service should be furnished "largely" by organized groups of medical personnel. Note the word *largely*. It does not say wholly or entirely. Furthermore, note the insistence on maintenance of "high standards" and also the emphasis not alone on the "preservation" of "a personal relation between patient and physician," but also on the "development" of this relation! In this connection let me remind you that the sort of charity that restores destitute persons to self-respect and self-support is no longer conducted by single, well-meaning individuals, but by trained social workers who operate from organized group centers. They do far more than merely "preserve" the personal relation, they have succeeded in developing it. Insistence on the maintenance of a personal relation between the patient and his physician should not be confused with a hazy desire to retain individualistic competition. The two things are quite separate. It is entirely possible to retain and to develop the personal relation between patient and physician and yet to do away with destructive individual competition. Note that I say "destructive" individual competition, for the majority report contemplates the continuance of the principle of free choice for those who desire it. In my opinion the medical profession has nothing to fear from the development of group medicine where and when it is necessary to adequate medical care as it is in some localities. But even this does not mean the universalization of group medicine. Do not forget the ease with which the medical profession was used by the conservative religious members of the community to resist the introduction of anesthesia eighty-six years ago[3] and even incited to persecute Dr. W. T. G. Morton, a discoverer of anesthesia. But today the use of anesthesia is an established practice. A century ago the objections to the establishment of the public school system were just as heated, just as

sincere, and just as futile as the present objections to group medicine. We now have magnificent systems of public education from the kindergarten to the university. A socialized system of education is accepted as a matter of course. But the private school and the private college have not disappeared. These institutions are stronger than ever. There is room for both because human life is so complex that it needs both.

The suggestions of the committee relating to the organization of groups are detailed and in the main socially and theoretically sound. Only experimentation and trial and error can determine the particular organization most appropriate for a given community. It is not possible in advance of experimentation to say with assurance whether the majority or minority proposals are right. The majority plan has one advantage, however, not shared by the minority plan, namely, that the planning groups should include lay persons. In a democratic society such as ours, experience has established the validity of the practice of wide representation of helpful interest on planning and governing bodies.

Since the second recommendation, advocating the extension of all basic public health services, is not so controversial, I shall next consider the third recommendation. This is that the costs of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both methods. The Committee states explicitly that this does not preclude the continuation of medical service on an individual fee basis for those who prefer the present method. I can appreciate that this recommendation comes as a shock to many of you. So much the better, because controversies make people think, make them attempt to justify procedures that are too often mere individual habit or use or wont. But let me insist that we examine this recommendation in the light of the principle that the costs of medical care should be considered from the point of view of a survey of the whole process and with a view to rationally planned organization. When one takes this position it is at once evident that the recommendation of group payment is not intended to be a legal requirement on all classes of the population. Insurance is designed only for those classes whose resources of intelligence, foresight or earning capacity are below the average and hence subject them to such insecurity that they become a menace to the rest of society, a burden on unorganized medical personnel, and a hindrance to the even and continuous operation of productive enterprises. Furthermore, tax appropriations from State and local governments are to insure hospitalization and other medical service for patients limited to those suffering from tuberculosis, mental disease, venereal disease, arthritis, and other chronic conditions, insofar as these persons are unable to provide suitable care out of their own resources. I fail to see anything socially unsound in such a plan. About the details of application there may well be disagreement, but the principle seems to me consistent with an effort to plan the organization of medical care in the light of the larger processes and trends of social change. Arguments to the contrary remind one of the opposition voiced a century ago to tax-supported schools, opposition two decades ago to compulsory workmen's compensation, opposition to unemployment insurance today; and yet tax-supported schools are an accomplished fact, workmen's compensation is accepted by employers in all industrial states, and unemployment insurance in Europe has, in the opinion of many thoughtful observers, prevented a social revolution and a lapse to communism.

Recommendation four—the study, evaluation and coördination of medical services as an important function for every State and local community, is one to which the majority and minority reports agree in principle, although they disagree as to the means of application. This recommendation gets at the very heart of the problem of maladjustment in the costs of medical care. It views the problem from the vantage point of envisioning the whole process and then proceeds to get down to practical details by the suggestion that *study* and *planning* should be a continuing and permanent function of local medical agencies. These agencies may well grow out of existing health councils, hospital councils or public health councils supported by Community Chests or Chambers of Commerce and local government or voluntary health agencies. The local county or city medical, dental, pharmaceutical and nursing societies should appoint committees to ascertain the facts regarding the local provision for medical service, and should include on such committees informed lay persons. More

permanent committees may be needed in some rural regions where provision for medical care is very inadequate. Finally, working up to the larger unit of area, there should be in each State a permanent organized agency for the *continuing study* of medical care, to prepare *a plan for its progressive development.* Particular attention should be paid to the development of adequate medical care in rural areas and to problems of the coördination of rural and urban services. Before setting up a new State agency, it would be wise to consider whether some existing board or commission can be used to adequately perform these functions. In my opinion the objections of the minority report to the recommendations of the Committee for group medicine in the form of medical centers and group payment, are based upon the assumption that group medicine is to be applied universally and without regard to local differences and needs. It seems to me perfectly clear that recommendation four provides exactly the social organization necessary to determine the possibilities of applying group medicine successfully. In other words, I am convinced that this emphasis on the organization of local agencies and committees for study and planning provides the medical profession with just the sort of check it desires on the dangers some believe to be inherent in socialized medicine.

The minority report recommending the trial of county and State medical societies as the agencies of study and planning, has the merit of utilizing existing machinery, and I cannot see that this idea is inconsistent with recommendation four of the Committee, *provided* the existing societies will meet intelligently the challenge of these changed times and furnish dynamic leadership in community planning. But when the minority report in recommendation six commends a careful trial of "methods that can be rightly fitted into our present institutions and agencies without interfering with the fundamentals of medical practice," I venture the hope that the mention of "the fundamentals of medical practice" has reference to scientific technic, an indispensable and justifiable limitation, and does not have reference to the present organization of medical care, which is far less well-developed than the science of medicine. In other words, it seems to me that improvement in the facilities for medical care should not interfere with the fundamentals of *scientific* medical practice. It all hinges on the use of the word "scientific," which unfortunately is not used in minority recommendation six. If the use of the word "scientific" was intended, then I agree to this recommendation. If, however, the minority intended to mean that the present organization of medical care is a sacred system not to be tampered with, then I emphatically disagree. In fact I am disposed to issue a warning. No minority is in a position to direct the course of social change to meet its own purposes, natural as such a desire is. One only needs to remind you of the impotence of certain so-called master minds of big business and big politics before recent tornadoes of social force. It is not a question of accommodating other institutions to any minority system; it is a question of fitting the organization of medical care to the pattern of more fundamental economic and social institutions in such a way as to preserve the essentials of medical science. The reasons why the choice does not rest with certain well-intentioned but misguided minorities is that, as individuals, we are all helpless before certain basic social changes. What are these social changes?

First may be mentioned the great trend of population to cities during the past generation. This particular social suction has drawn more medical personnel to the city than the city can support at an adequate income. And yet there are those who would interfere with the "right" of the individual to be drawn into a social maelstrom. Fortunately the process seems to have reached its saturation point. But there is still need of organized effort to stem the tide of medical migration to the city. The second great social change is that population has ceased to increase at its old accelerating rate. The rate is declining. Within a generation we shall attain a stable population. This means that services of all sorts can no longer count on boundless opportunities of expansion. It is going to be necessary for us to use our resources far more carefully than hitherto. The third great social change is linked up with the second; it is that the age group structure is changing. Our population is aging. I need not tell an audience of scientific medical practitioners what this is going to mean to medical care. The fourth great social change comes as a result of the shorter working day and the shorter working week. It

is that people will have more leisure time for education and self-improvement. Finally, great social changes are due as a result of synthetic chemistry. Even now the linseed oil industry of this region is about to be superseded by a superior and less expensive synthetic oil, just as was the natural wood alcohol industry destroyed almost overnight by the synthetic creation of this product. Already the Germans make synthetic gasoline and baser oils from lignite, and it may only be a matter of time when the Dakotas will be dotted with new towns built upon the manufacturing of synthetic oils and gasoline made from their immense supplies of native lignite. These are some of the great social and economic changes now in process. These constitute the evidence upon which the claim is made that as individuals we stand helpless before elemental social forces. Our salvation lies in creating a social organization, tough enough to resist violent changes and yet sufficiently flexible to admit of some degree of guidance and accommodation. Hence, my reason for not accepting Dr. Fishbein's contention that the report of the Committee proposes a plan that will lead to revolution. Gentlemen, the shoe is on the other foot. If an overconservative policy of undue resistance to inevitable social change is adopted, then indeed you may expect a revolution, a revolution about which there will be no mistake—it may be more nearly in the nature of an explosion. In my opinion, the Committee report presents the outlines of changes in the organization of medical care that may avoid revolution and lead in fact to an orderly evolutionary process.

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MAJORITY AND MINORITY REPORTS OF THE COMMITTEE ON THE COSTS OF MEDICAL CARE*

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IT is very appropriate that a layman lay a sociological foundation for this question first. I am given thirty minutes to discuss five years' work. In the thirty minutes I am going to make just a few suggestions rather than a discussion, and let you do the thinking. You will have to do it in the long run anyway. Your conclusion finally will be your guide which will shape your path.

Before I go on with the report itself, I am very much interested in one or two things that Dr. Chapin mentioned. One of them was the rapid change due to transportation. I just want to call it to your attention before I forget it. I imagine that in the last fifteen years a good many medical practitioners have had to move from their small town locations into the cities to save their practices. The place to get adequate medical care, in the opinion of these people, whether it was right or wrong, had shifted from the small town general practitioner's service which is now being suggested for the general public consumption to the city specialist. I wonder how we are going to change the idea of the general public on this particular thing. People generally will pass my office in a town forty miles from here and come to my confrere in this city, who does not know any more about it than I do, thinking that they are getting something better, perhaps. That brings the question a little more fundamentally, it seems to me, to the general consciousness of the people themselves regarding specialization or better practice, rather than just the matter of adequate care wherever you might get it.

This report which I have in my hand is the child of forty-eight people. I don't know just how the chromosomes are split or apportioned.

*Presented at the Conference to discuss the Majority Report of the Committee on the Costs of Medical Care, under the auspices of the Minnesota State Medical Association, Minneapolis, December 18, 1932.

Some of us have not claimed this child to any great extent. Some of us have even gone further than that and disclaimed him entirely, even though we have had some interest and some influence in his birth. We have one majority report, two minority reports, and two individual statements by committee members. In the majority report we find five recommendations. How many of you have read the five recommendations of the majority report? I should like to see how many really know what is in this. A very few. How many know what is in the minority report? The same number or less. The fact of the matter is we do not know very much about this report, do we? I am going to take the time to read some of these recommendations which have not been read. I will start with the first one. It has been stated by Dr. Chapin. This is the majority report:

"The Committee recommends that medical service, both preventive and therapeutic, should be furnished largely by organized groups of physicians, dentists, nurses, pharmacists and other associated personnel. Such groups should be organized preferably around a hospital for rendering complete home, office and hospital care. The form of organization should encourage the maintenance (*should encourage the maintenance*) of high standards and the development or preservation of a personal relation between patient and physician."

As a start, I will say that the premise laid down by the chiarman of this committee of forty-eight, as it turned out to be, was that we should not disturb the personal relationship of the physician and the patient if we wanted to keep medicine on the high standard that it is at the present time.

"The Committee recommends the extension of basic public health services, whether provided by governmental or nongovernmental agencies, so that they will be available to the entire population, according to its needs. Primarily this extension requires increased financial support (I am glad that is brought in there because I want to say something about that) for official health departments and full-time trained health officers and members of their staffs whose tenure is dependent only upon professional and administrative competence."

Before I go any further, if we are studying this report, including all of the studies, we will find that if we extend medical care to all of the people adequately, as this recommends, the medical bill will not be $3,500,000,000. In dentistry (I can talk about that because I happen to be a dentist) it will be three times that figure at least, because we are doing adequate dental operations for about one-third of the people, or less. We had a little private fight in the committee about the name "The High Cost of Medical Care" which was given to the committee in the beginning, and finally was changed to "The Costs of Medical Care." It could just as well have been left "The High Cost of Medical Care" because if the recommendations of this majority report were to start functioning tomorrow, our medical bill would be considerably more than it is at present. However, we are given this assurance by leading economists, that this country can stand a medical bill of at least $6,000,000,000 without any trouble, and should.

The third recommendation:

"The Committee recommends that the costs of medical care be placed on a group payment basis through the use of insurance, through the use of taxation or through the use of both of these methods."

Before I go on with this, I shall simply say that if you have studied the question at all you know that this is the only outstanding country that is not socialized, medically speaking. To the best of my ability I have been trying to find reports from the other countries as to whether the people dispensing medical care are anxious to go back to the old system of private practice. I shall be glad to get this information from anybody who has it. The information I can get is that they are more willing now to get the "bugs out of the machine" they have (that is putting it in the parlance of the street) and not go back to the old system.

I can point out countries which this would involve. One country is England. You know that it was socialized in 1911 by parliamentary vote. This meant that we as physicians and dentists in England could have had something to say about the radical change had we wanted to; instead, we did not say anything excepting that it could not be done. Then we said, "It must not be done." The next day it was done, without any of our recommendations.

Digressing a little, we can take the same attitude here if we care to. In the Minority Report No. 2 you will find the statement that "we think it is dangerous for the professional group to stand aloof or actually oppose something the pub-

lic wants" because the public gets what it wants, whether we like it or not. Better, that we have an idea and present it. This idea must be sound from a medical point of view, sound from a sociological point of view, and sound from an economic point of view. We can get men outside of the professions, if we do not feel ourselves capable, to give the general tone socially and economically to our recommendations. This is not meant to preclude the continuation of medical service provided on an individual or fee basis, for those who prefer the present method.

"Cash benefits, that is compensation for wage loss, due to illness, if and when provided, should be separate and distinct from medical services."

This is simply stating a fact that has sadly interfered with practically every system which has been put into practice in any of the countries. This fact should not be overlooked in this country, for it is a fault which we have in some of our insurance systems which are in vogue at the present time in different parts of this country.

"Fourth. The Committee recommends that the study, evaluation and coördination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the coördination of rural with urban services receive special attention."

That has been covered very well by Dr. Chapin.

"Fifth. The committee makes the following recommendations in the field of professional education (and here we have something new): That the training of physicians give increasing emphasis to the teaching of health and prevention of disease; that more effective efforts be made to provide trained health officers; that social aspects of medical practice be given greater attention; that specialties be restricted to those specially qualified, and that post-graduate educational opportunities be increased.

"(b) That dental students be given a broader educational background.

"(c) That pharmaceutical education place more stress on the pharmacist's responsibilities and opportunities for public service.

"(d) That nursing education be thoroughly remolded to provide well-educated and well-qualified registered nurses."

I am going to stop here a moment. We are graduating about 20,000 nurses a year in this country. I don't know just what the average income of the average registered nurse is, but it is about $1,000 or less. There is no question but that we have problems in our own backyard which should be solved, economic problems in our own professions, and this is one of them, it seems to me. I just wanted to call your attention to it.

"That less thoroughly trained (and this is something new that is being recommended) but competent nursing aids and attendants be provided. That adequate training for nurse-midwives be provided, and that opportunities be offered for the systematic training of hospital and clinic administrators."

This will have something to do with our educational program. Without any further comment on phases of the majority report, I am going to read the recommendations of Minority Report No. 1:

"No. 1: The minority recommends that government competition in the practice of medicine be discontinued, and that its activities be restricted (a) to the care of the indigent and those patients with diseases which can be cared for only in governmental institutions; (b) to the promotion of public health; (c) to the support of the medical department of the Army, Navy, coast and geodetic survey and other service which cannot, because of their nature or location, be served by the general medical profession, and to the care of veterans suffering from bona fide service-connected disabilities and diseases, except in the case of tuberculosis and nervous and mental diseases.

"No. 2: The minority recommends that government care of the indigent be expanded with the ultimate object of relieving the medical profession of this burden.

"No. 3: The minority joins with the committee in recommending that the study, evaluation and coördination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the coordination of rural with urban services receive special attention.

"No. 4: The minority recommends that united attempts be made to restore the general practitioner to the central place in medical practice.

"No. 5: The minority recommends that the corporate practice of medicine, financed through intermediary agencies, be vigorously and persistently opposed as being economically wasteful, inimical to continued and sustained high quality of medical care, or unfair exploitation of the medical profession.

"No. 6: The minority recommends that methods be given careful trial which can be rightly fitted into our present institutions and agencies, without interfering with the fundamentals of medical practice.

"No. 7: The minority recommends the development by state or county medical societies of plans for medical care.

"The minority group of the committee whose names

are subscribed to this report are in accord with the majority in many of their conclusions and recommendations."

The last statement gives you an idea that we are in accord with the majority in some of its main points. This is Minority Report No. 1, however. The following is in regard to majority recommendations 1 and 3 dealing with organization of medical services and group payment for medical services:

"The convictions of this minority are so divergent from those of the majority that they must be discussed in detail."

That discussion takes up a considerable part of the minority report No. 1. I wish I had time to read it all to you because it goes into the two fundamentals of medical practice.

From Minority Report No. 2 which has been given by two dentists, the only two practicing dentists on this committee, I will read an opening sentence or two to give you the general idea of their conclusions:

"The undersigned are in accord with the main position of the majority of the committee in that we recognize existing professional and social trends in medical care as brought out by the committee's studies, and believe that these trends necessitate substantial changes in the manner in which medical service is rendered and paid for."

This is an implied indictment of our own profession by these two members. There is no question in our minds about our inability to serve all the people adequately and I might say that we are willing to take the consequences of our rather plain statement as two individuals, for no pressure was brought to bear on us in making this statement.

Another conclusion of these two committeemen is this:

"Nothing, in our opinion, would be more detrimental, not only to the medical service of the public but to the welfare of the professions than an attitude of opposition or mere aloofness on the part of the professions."

I don't care who instituted this committee; I know it was instituted. I know it spent five years in study. I know that during that time there may have been different pressures brought to bear on different members of the committee; I am making no insinuations, but I say it may have happened. I know there might be a chance for some criticism of some of the studies. There is no question in my mind but that some of them are part truths only; however, they are in the form of conclusions and are before the American public today. What are we as professions going to do about it?

The American public, as Dr. Vincent, a former President of our University, once said, gets what it wants. Radical changes might come through propaganda from two or more people who have ideas. Whether these ideas are pointed in the right or wrong direction, the public gets what it is after. If you and I can be classed among the fifteen per cent of intellectuals of this country, it seems to me that, with this document before the American public, and with our own admission in the majority and minority reports that there is something wrong with our dispensation of medical care, we should be able, in a measure, to place before this American public a plan which will not lower the standards of medical service but which will give to more people than it has ever been given before, in a way that no layman can possibly give it, the things medically which they are in need of.

The question is not whether we are getting enough money for our service; it is whether we are giving service to the people that should receive it and what kind of service we are giving.

To reiterate, if we do nothing else, let us have a program which will fit in with the economics and social life of this country. It is not as simple as we might think. Medical care brings in every phase of the social structure. We cannot get away from that. It is not an easy thing to make a program. I am not an economist, and I am not going to tell you what kind of a program to make, but I say we have brains in these professions, and it is now time to use them.

While I cannot hope to go into this subject in a scientific way, my plea is what I have just made, a coöperation in the professions which will make a comprehensive plan, in lieu of the conclusions that are before the American public at the present time, for adequate medical care.

THE MINORITY REPORT OF THE COMMITTEE ON THE COSTS OF MEDICAL CARE*

OLIN WEST, M.D.
Secretary of the American Medical Association
Chicago

I HAVE the highest regard for the opinions that have been expressed to you here by the two speakers who have preceded me, and I have the highest regard for the speakers themselves, but in so far as what they have said has been intended to apply to medical practice, I find myself in agreement with almost nothing that they have said. It is my purpose to base my discussion on their remarks.

Reference has been made to a crisis supposed to exist in medicine, and to the economic crisis. There have been crises in medicine ever since medicine came into being. There have been recurring economic crises, all of which have, in my opinion, developed because of an almost absolute disregard for fundamental principles, biological principles, economic principles, and ethical principles.

The crises that have arisen from time to time in the field of medicine have many times, if not always, been largely due to conditions that have been artificially created, over which medicine had no control.

The Committee on the Costs of Medical Care, in my humble opinion, has to a certain extent done just what was done by the leaders of finance and industry and government and philanthropy in producing the saddest economic, or rather uneconomic, situation that has ever existed in the history of the world. The Committee has largely ignored, in my humble opinion, fundamental biologic, economic and ethical principles. It is my hope that the medical profession will not fall into the same error and ignore the fundamental considerations that must be basically considered in the provision of any plan intended to be useful and for the service of humankind.

Reference has been made to certain "facts" in the majority report of the Committee on the Costs of Medical Care. There are certain facts in the report; there are certain half facts in the report, and there are certain so-called facts in the report that never were facts. Some of the so-called studies that were made by the Committee, on which its report was supposed to have been based, were really only partial studies that applied to a minute part of a great picture. They did not cover the whole picture, as it will be necessary to do before any of the fundamental considerations involved can possibly be properly settled.

Dr. Rudolph has told you that certain of these studies are subject to criticism, and I heartily agree. For instance, the report is supposed to be based, in parts, on a so-called investigation of industrial medical service. The fact is that the committee's investigators studied three industrial medical services in the United States, *the* three in the United States, perhaps, which lent themselves most to favorable comment, and did not study a single one of the inferior industrial medical services of this country that are pernicious, always have been and always will be pernicious as long as they are carried out on their present basis of operation. The result is that the majority report of the committee does not point out the dangers that are inherent in certain forms of medical practice that are not designed to serve the best interests of scientific medicine, or, what is of more importance, the best interests of the public.

An investigation was made for the Committee by a Ph.D. to evaluate the medical service of an individual state. The investigator had no medical experience. This so-called study was made in one of the oldest states in the Union, with a capable medical profession that has served the people of the communities of that commonwealth for more than one hundred years and has given them good and efficient service. The Ph.D. who evaluated the medical service in this state, apparently because he did not find every doctor in it with a blood metabolism apparatus under one arm and a microscope under the other,

*Presented at the Conference to discuss the Majority Report of the Committee on the Costs of Medical Care, under the auspices of the Minnesota State Medical Association, Minneapolis, December 18, 1932.

reported, in effect, that the medical service of that state was unsatisfactory, inefficient and incompetent.

I stand here today, as I will stand anywhere else, and say that that was a cruel misrepresentation of fact, and that it is a cruel thing for any agency anywhere, at any time, under any pretext, to destroy the confidence of the public of any community in the only medical profession that it has or that it is going to have for a long time, when that profession has made a record of sacrifice and devotion to the cause of humanity such as has been made in that state and has, at the same time, established a fine record for efficient service.

Dr. Fishbein has been gently accused of misrepresenting the facts concerning the origin of the Committee on the Costs of Medical Care. For the information of the speaker and for the information of this audience, I may say that it is my understanding that Dr. Fishbein's statement is based upon the personal communication of the gentleman whose name was mentioned by Prof. Chapin, claiming credit for instigating the movement that brought the Committee on the Costs of Medical Care into being.

It would be interesting to know just how much this gentleman and others like him contributed, in the process of building up fortunes of millions of dollars, toward making it possible for those whose labors made their accumulations possible, to buy and pay for needful service, on the basis of American principles. The majority report harps on the fact that most of the people of the country have incomes so small that they cannot pay for service of the most needful kind, but I cannot recall that one word of protest is offered against that uneconomic situation.

Something has been said about the need of the medical profession being aroused. I stand here to say that the medical profession has always been aroused, and it has never been anything but aroused. From the very time of Hippocrates until the present minute, medicine and the medical profession have been progressive and never static. I defy any group on the face of this earth to produce a record for progress that will surpass the record of scientific medicine. I defy any group to present a record for devoted, unselfish, efficient service that will surpass the record made by the medical profession. Medicine has never been satisfied; it has never stood still. Its knowledge has been developed through the devoted service and through the observing experience of a self-sacrificing, intelligent, devoted profession. The highest ideal of that profession, from the days of Hippocrates until now, has been that the interest of the individual patient and the interest of the public shall be first. Organized medicine adopted that principle in the very beginning and has never departed from it to even the slightest extent. As long as the medical profession is permitted to exist as a profession, you may be sure that it will never depart from that highest ideal.

Something has been said about the need for the medical profession to put its house in order. I agree most heartily with that sentiment. There is need for every house to be put in order. The biggest mess that has been created in the house of medicine, however, has been created by promoters and theorists, amateur and professional, faddists and agitators, amateur and professional, through their preachments to the public. I do not contend that medicine is perfect. I do not contend that the medical profession is perfect for I know it is not. The very simple reason why it is not is that it is made up of human beings. I know just as well as anybody else knows, and a little bit better, that undesirables have succeeded in securing license from the state to practice medicine, but I also know that the organized medical profession has fought them to their death, and that it always will, in an effort to prevent their impositions on the public. Medicine strives to keep its house in order and will continue to do so.

There are many artificial schemes that have been promoted for the provision of medical service, including some of those which have been proposed by the Committee on the Costs of Medical Care. In my humble opinion, the committee did not study the effects of the operation of these schemes any more than it studied the effects of the operation of so-called industrial medical services of an inferior sort.

I have been in position to observe the work of medicine for nearly forty years, and I have had opportunity to observe from many standpoints. I studied medicine, taught in a medical school for sixteen years, practiced medicine for nearly thirteen years, was in the state health service for twelve years. I was the secretary of my state medical association for ten years. I have

been Secretary of the American Medical Association for nearly eleven years. I have belonged and have actively participated in the work of various organizations whose activities touched medicine and its service in one way or another. I was a member of the Committee on the Costs of Medical Care, perhaps a poor one, but nevertheless a member. Incidentally, I was a member of the Commission on Medical Education. It is interesting, by the way, to note that the report of the Commission on Medical Education, which has just been released from the press, studied some of the very things that are supposed to have been covered in the studies of the Committee on the Costs of Medical Care, and comes to conclusions that are exactly opposed to those of the majority group of the Committee on the Costs of Medical Care. The Commission on Medical Education opposes the socialization of medicine. It opposes the schemes that are proposed by the majority report of the Committee on the Costs of Medical Care. It is interesting to note, also, in passing, that two members of the Committee on the Costs of Medical Care who signed the majority report are also members of the Commission on Medical Education, which brings in exactly opposite findings. These two gentlemen, in so far as I am informed, registered no complaint against the findings of the Commission. Just how they can justify themselves in that situation, I do not know.

As I say, my observation of these artificial schemes has been extensive. I will tell you how some of them work as I have seen them in operation. They work by promising a great deal and delivering comparatively little. Pretending to reduce the cost of medical care, the first thing they do in many instances is to send out agents who sell their "services" and receive commissions varying from twenty-five to fifty per cent on their sales. So, before they ever get started, anywhere from twenty-five to fifty per cent of the funds that are supposed to be realized immediately have been dissipated in paying the commissions of solicitors. The cost of medical care for the general run of the people will not be reduced through any such process as that.

Another thing that happens under the operation of these artificial schemes is that whenever one of them succeeds financially, even to a slight degree (and when they do not succeed financially they just fade away like snow before the sun), it almost invariably stimulates the development of other somewhat similar schemes which invariably offer more for less, with the result that the medical profession is pauperized and the quality of medical service is constantly deteriorated.

What the minority group of the Committee on the Costs of Medical Care stands for is to prevent the deterioration of medical service, to preserve professionalism, which must be preserved if humanity is to have the benefit of the proper application of scientific medical knowledge. Is there anybody who believes that professionalism (which is a poor word to express what I have in mind but is the only one that comes to mind) will be permitted to continue under political domination or under the domination of those who know nothing whatever about what is actually involved in the delivery of medical service?

Taxation! What did you ever know of that was supported by taxation that was not politically dominated? There is only one instrumentality through which the facts of scientific knowledge can be applied for the benefit of humankind, and that is a qualified, free medical profession. Whatever tends to destroy professionalism in medicine tends to bring disaster to the people who need its service. I know that some will say that is opinion, and it is, but it is opinion based on nearly forty years of observations from a vantage point right in the middle of things as they have gone on day after day.

This depression we are in is an artificial situation just as the great wave of so-called prosperity was an artificiality. There isn't a man in this room who did not know long before this depression hit that it was bound to hit. There was no escape from it, because business, finance, government and philanthropy made the conditions that made it inevitable by their disregard for the simple fundamental laws of economics. I don't know where the sociologists and the economists were in 1928 and 1929 that they did not tell us about what a terrible fix we were going into.

There are many things in our social fabric that are artificial. The fundamental questions of human welfare are never going to be properly solved until many of these artificialities have disappeared. One of them is that monstrosity

that we know as the modern city. The influences that have come out of the modern city have made many of the phases of this crisis in medicine you hear about.

Something has been said about the lag in the application of medical science. I thank God there is a lag. If there were not a lag in the application of medical science until we could determine what science really is and is not, there would be many more graves in our cemeteries, and our highways would be thronged with the lame and the halt.

Something has been said about the wonders of our educational system, and it is wonderful. But, in my humble opinion, there are certain influences that have come out of the educational system as it exists today, that have played a very considerable part in producing the crisis that has developed in the life of this nation. I say again I am expressing only my personal opinions that with me are convictions; if there is anything more to convictions than there is to opinions, I should like to get credit for that. An attempt has been made, and has succeded in a certain sense, to make the schools serve the purpose of the home. There is no institution, school, church or club, that can properly perform the function of the home. In the same way there never will be an institution that will successfully bring good medical service to the people, except the institution of medicine, and that can not do it unless it is left free from political domination and unqualified lay dictation.

Something has been said about blind effort. The medical profession may be blind, but from the very beginning until the present moment the medical profession has been engaged in persistent effort to make it possible for all mankind the world over to receive the benefits of the scientific knowledge that it has developed. The knowledge of scientific medicine has been handed down generation after generation, from physician to physician, and from physician to the world of physicians, with the admonition that it must be used for the benefit of the individual man and for the benefit of men collectively. In my humble opinion, again, not to say conviction, the job has been pretty well done, blind or not.

Something has also been said about the individual aspect of the medical practice. If our sociologists, economists and philanthropists could all be made to practice medicine for about five years, and if our doctors could all be made to study fundamental economics for about five years, I think we would come to an agreement, and the agreement would stand for the very things that the medical profession stands for now. There is no possibility of providing good medical service except on an individual basis. Machine methods, mass production methods may be applied with some measure of success of a certain kind when all human beings have been standardized to react exactly alike to all stresses and strains, to react exactly alike to all medicinal agents that may have to be applied, to react exactly alike to all mental stimuli and physical stimuli. When that time comes I hope you and I will not be here to see the mess that will exist in the world. It is written in the Holy Book that the meek shall inherit the earth, but, in my opinion, it will be a hell of an earth when everybody is meek and when everybody is alike.

It just so happens that when time began, certain immutable biologic laws began to work. They are working now though some of us are trying to upset them, and they will work until time is no more. There will never be any method through which the benefits of scientific medical knowledge can be successfully applied for the relief of mankind and for the improvement of mankind, except through methods that have an absolute regard for those unchangeable laws of nature and that recognize that an individual is an individual. What is good for Dr. Johnson is worth nothing for Dr. Braasch; even though they weighed the same and looked alike, which God forbid, thought alike, ate alike and *were* alike so far as you could tell by looking at them. There is still inside of each one of them something which, for want of a better word, we must designate as a soul. Medicine has to deal with that, whatever it is, that we call a soul, and medicine can never succeed in its high purposes except as consideration is given to the individual soul in the individual man. There is more to it than pouring them in and grinding them out, which is the system of socialization.

Something has been said here about the wonderful improvement that has been effected in certain phases of medical practice in Great Britain. Oh, yes, I have no doubt there is an improvement. An improvement over what? An improvement over a situation that was absolutely impossible because the people that are now

served by the so-called panel practice system were served first by voluntary insurance groups that worked just like all voluntary insurance groups work, to the disaster of the public. The present panel system may be an improvement over what preceded it, but it has in it the same inherent possibilities that the other system had.

A very distinguished gentlemen who is, apparently, a proponent of panel practice, recently told me of some of his observations in England, where he went over a large part the country to look into the actual conditions of panel practice. He found a friend who graduated in his class in medicine, who went to England to finish his post-graduate work and decided to stay there. He is now a panel physician. They went together to the doctor's surgery, where they were confronted by a large group of panel patients. The doctor said, "All of you who are coughing, stand up!" All that were coughing were brought into his office, given instructions without examination and sent out. After winnowing them out on the basis of the outstanding symptoms presenting, there were two or three left over who were really sick. These were given a half-hearted examination and were then sent to the hospital, where they had to be waited on by competent physicians who did not get one cent for their services. That is how socialized medicine works. It destroys scientific ambition. It destroys scientific initiative. It destroys professionalism in medicine, and tends to destroy the only instrumentality through which its benefits can be effectively brought to the service of mankind.

A distinguished British physician made a wonderfully amusing remark to me when he said, "West, I am getting a little uneasy because I think I can see that it may be possible the slimy hand of politics will inject itself into this panel practice scheme." Well, the slimy hand of politics will very likely inject itself into any situation that is operated under political control.

Emphasis has been laid on the fact that the majority report of the Committee on the Costs of Medical Care insists on the maintenance of the intimate, personal relation between physician and patient. That is fundamental in the successful practice of medicine, from the standpoints of patient and physician. But the personal relation that is so basic to the needs of the individual who seeks medical service can not be maintained through any scheme whereby the medical profession is socialized, or whereby the patient is made subject to methods of machine operation, as would certainly be the result of the adoption of the plans proposed in the majority report.

The plan of group purchase is not as free from faults as the majority report would have you believe. Many times the group purchase scheme is pernicious to an extreme degree. It is not fair, to say the least of it, to hold the plan out to the people as one that is in any sense ideal. Group purchase is no new thing. It has not been generally accepted by the profession, as it would have been long ago had its weaknesses and its blighting effect on scientific initiative, scientific ambition, and professional independence not been well understood by physicians. And that means that physicians have thoroughly appreciated the evil effects on the public welfare, of machine methods, and have kept constantly in mind the fact that under the ideals and traditions of medicine the interest of the patient and of the public comes first.

I believe in "organized charity," which has been referred to here, but I don't believe there is any great magic in the name "organization." I dare say there isn't a physician in this audience, who, in spite of the operations of organized charity, has not had to go right down in his own pockets time and time again and pay for the basic needs of patients who had called for his services. Organized charity is very weak in many places, because it has had far too much of the mass-production, machine principle injected.

Of all the groups that would be most ruined by the machine principle, the medical profession is *the* group. How can you maintain the free choice of physician, which is the right of the patient, if you are going to mechanize and socialize the medical profession? It cannot be done.

Voluntary insurance has always been the forerunner of compulsory insurance. Don't forget that. In every country, insofar as my knowledge goes, and I have studied the thing some, voluntary insurance has preceded the installation of a system of compulsory insurance. If you will read the majority report of the Committee on the Costs of Medical Care carefully, and if you had read the book which preceded the work of this Committee, written by its director, you will be-

come quickly convinced that compulsory insurance is the thing that is eventually aimed at.

It would be easy to provoke considerable argument over the discovery of anesthesia, referred to by one of the speakers here today. If you go down to Georgia and say that Morton discovered anesthesia, you will have cause to regret it because they believe down there that Long did it, and will produce documentary evidence to prove it. If we are going to direct medical affairs, let us know medicine.

The greatest fallacy that has ever been preached is that you must not criticize anything unless you substitute something for it. I do not believe there needs to be anything substituted for the institution of medicine. There are certain inequities that ought to be removed from the situation. Medicine ought to strive, as it has always done, to make its services available to every human being that is in need of medical service. Medical organization ought to strive to perfect itself as it has always done so that its service and the services of physicians as individuals and collectively can be rendered to better advantage in behalf of all mankind. I am proud to say that has been the constant aim of medical organization and that it will persist in its efforts to that end.

Dr. Rudolph, with whom I had the pleasure and privilege of serving on the Committee on the Costs of Medical Care, two or three times said something to the effect that he did not know how much stress or how much pressure had been brought upon members of the committee. Well, I was on it for about five years. I never had a human being on the face of the earth, anywhere, at any time, even suggest to me what I should think or do as a member of the Committee on the Costs of Medical Care. My actions as a member of that committee are my own actions. I am responsible for them, and they are based on the convictions I have tried to express here today.

I would admonish the physicians of this country to scrutinize with the most extreme care any plan involving the delivery of medical service that may be presented to them with a view to their participation.

If a plan can be brought forward that will fit into the social fabric, that will not destroy institutions that are essential for serving the deepest needs of humanity, let us get in and help promote it and perfect it and carry it on, but let us be sure that those conditions are met.

I stand for the principle that if any new plans for providing medical service are to be put into operation, they should be controlled by the medical profession, which is the only group qualified to know what is good and what is not good. Certain plans have been put into operation by medical societies. They have found, in most instances, that to make them go they have had to resort to the same purely commercialistic practices which have been used by purely commercialistic groups that have promoted similar plans in their own communities.

My final word would be to say to you to help, help in every way that is possible, in accordance with the highest traditions of medicine, than which there are none higher, and in accordance with ethical principles, and in accordance with sound economic principles, and in accordance with the laws of nature itself. Help promote everything that will advance scientific medicine and will make its benefits easily available for every human being everywhere. But be sure that you do not promote some artificial scheme that in the end is going to produce exactly the opposite effect.

SOME PRINCIPLES INVOLVED IN HEALTH INSURANCE*

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SO much has been said and written recently pertaining to the economics of medical practice that one is bewildered. It is therefore proper that our national and state societies should encourage and create opportunities for discussion of these important problems. Each state society through its executive officers must be

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prepared to give advice and counsel to the component societies and their members, which means that our officers and our councillors must acquaint themselves with the current tendencies in medical practice and the outside influences that are acting upon them. At the present time this is no small matter for it is not at all easy to view clearly the present situation. We must evaluate our methods of practice and support all that is proven by time to be good in them but we must consider without prejudice suggestions and recommendations for changes. Nobody is more fit to judge as to the type of medical practice that will be best for the people than the medical profession and we must not permit outsiders to manage our affairs. Organized medicine must see to it that we are not stampeded into some unsound scheme. In times of economic distress such as these our members suffer as acutely as any other group and may be enticed into entanglements of various kinds of contract and insurance practice that are not sound that will cost the people and the profession dearly in the long run. There are certain sparsely settled, industrial localities where some form of contract practice is for the best of all concerned and under certain existing conditions has the sanction of organized medicine. The fact is that, after all, these various schemes cannot work without the coöperation of the medical profession. If organized medicine, whose ranks are composed of the best in our profession, refuses to support any given system of practice it cannot be carried out. It may start but its end is certain when only the least qualified by nature, inclination, and training are to carry it on.

We must stand together. In the larger cities and centers we unfortunately must acknowledge that many of our leaders in scientific medicine have been but casually, and often only selfishly, interested in organized medicine. They have assumed an irresponsible and a critical attitude. But even they are beginning to realize that such wide sweeping reforms as are recommended in the majority report of the Committee on the Costs of Medical Care will affect every one in the profession. All must give their support in combating the recommendations that are inimical to sound practice or the trend toward socialization may bring their house tumbling about their heads.

Perhaps we are unduly alarmed but a little honest fear as to consequences leads to preparation to prevent trouble. We have cause for worry and it behooves us to do some thinking along the lines of economic affairs, not only as they concern our own profession but along broader lines. We must play our part as interested citizens and protest in no uncertain terms against the encroachment of national government into private business and urge that it about face and tend to its duty of furnishing us, as it was originally intended to do, the political liberty to carry on in an independent untrammeled way our jobs in a manner in accordance with the traditions of the American people. If our government holds to its present direction and the rate of speed it will defeat the very object of its birth.

Before such a gathering as this it is unnecessary for me to go over ground already so well covered by speakers much better qualified than I am. This meeting of our State Society is in reality a call to awaken interest. We have men in our national and state associations studying the problems that confront us and we must acquaint ourselves with their teachings. If those teachings are not sound I have not the least fear that they will prevail for our profession will not accede to anything that smacks of selfishness. The interest of the patient always comes first and fortunately what is best for him is also best for us.

The probabilities are that the present widespread economic crisis will cause more attention to be paid to the fundamentals causing the distress which well meaning socially inclined people thought was caused by the so-called high cost of medical care. Let us hope that they will see the light and investigate the cause and not the effect.

The time has come for us to consider the question of health insurance, not in the abstract but in the concrete. Various plans are making their appearance in our midst. We have numerous examples abroad to study but of all, the British should receive our most careful consideration. Our political and social life is tinged with the British imprint more than any other, our traditions and ideals are similar.

We should ask ourselves first whether we are in favor of any plan of health insurance. Undoubtedly the immediate reaction of the average physician in this country to such a question has been up to the present a prompt denial not unheated in its nature. The question, however, must have careful consideration and a thoughtful

answer. Merely because we do not want bureaucratic medicine does not mean that some form of health insurance cannot be worked out. The lack of foresight and often inability of people to provide against the unexpected expense of illness with all the sacrifices and heartaches that ensue is known only too well by physicians. They are whole heartedly in sympathy with any sound plan that will provide against this unpreparedness. There are two distinct groups of people concerned, those who could but do not budget in some manner against the cost of illness or accident, and those who are forced to live so close to the margin of their slender incomes for the very necessities of life that such provision is well nigh impossible. When illness strikes the latter they form the group spoken of as the indigent sick and should be separately considered. The medical profession realizes that it is quite probable that before long some form of health insurance will be offered on a large scale by our insurance companies, who have been closely studying the problem for some time. The numerous examples of this type of insurance in European countries have furnished splendid experiments and sufficient time has elapsed to prove or disprove the value of such attempts. It should be our hope and endeavor that in America, where individualism is still in favor, health insurance free of governmental control can be carried on. We must conclude from a purely theoretical and logical line of reasoning, putting aside the complexities that arise from the human side, that health insurance is just as desirable as life insurance or accident insurance. The great difficulty, and the one that has held back the development of health insurance by our large financial companies, is the uncertainty as to when the individual has, so to speak, lost his health and when he is able to return to work. In life insurance payment is made on death. In accident insurance payment is made on evidence of proof of injury by accident. In the latter difficulties arise when the severity of the degree of injury is to be determined and the length of time it takes the insured to recover and go back to work. The comparatively few number of accident cases and the more or less definite nature of the injury and duration of disability have made it possible for this type of insurance to work out more or less satisfactorily. It does not take much of a flight of imagination, however, to conjure up the many difficulties that are to be encountered when health insurance on a large scale is in force. In the countries in which it is in force it is freely admitted that the health of the people is certainly no better and that the incidence of sickness has increased by leaps and bounds, particularly around holiday seasons. Human nature with all its weaknesses and absurdities is the same the world over and is an intangible and most uncertain quality to deal with and throws askew statistical estimations of the incidence of sickness and the length of disability based upon figures obtained from a population not living under health insurance.

If a plan of health insurance is developed what is to be the relation of the doctor to it? For the best interest of the patient his relationship to the doctor must be the same as it always has been. The destruction of this relationship has been the rock upon which contract practice has always split. The doctor must be free and untrammeled in his treatment. Granting that certain abuses arise under our present system, nevertheless, the abuses are many times greater when lay control exists and these abuses always act to the detriment of the patient. The medical treatment should be completely under the control of the profession. The fees for medical service should be separate and distinct from the cash benefits to the patient for his time lost due to sickness, disablement and invalidity. Just how the physician is to receive his compensation is a matter to be determined. Putting upon the doctor the responsibility of saying how long disability benefits shall last is unfair to the practitioner and is a constant source of irritation under the various systems in existence. Our duty is to get our patient as nearly well as we can and our sympathies are naturally with him. If we deny him disability claims we lose him and his family. We must accept our share of this difficult problem but the lion's share should not be ours.

There are many questions of this kind that we might consider, but time is short and I am merely touching upon these few points as suggesting to you the difficulties that arise when this question of health insurance is considered.

WHAT IS GUILD MEDICINE?*

RICHARD E. SCAMMON, Ph.D.
Minneapolis

LADIES and Gentlemen: You know I am one of those Ph.D.'s at whom roses have been thrown in the course of the afternoon. Now I have three slight defenses which I will offer for my position. In the first place, it happened to me when I was very young. In the second place, I have had the fortune of being with medical men continuously for a period now of twenty-eight years. In the third place, I think you will see that some of the views I have to present agree with the opinions of certain medical men here today.

I should like to attempt to present my ideas this evening in part graphically, and to start my graphic presentation in this fashion: We very often think of the present controversy as a discussion of two radically opposed forces, of the individual in medicine (and now I am speaking from the strictly economic and not the professional point of view) as against the state. We may picture this concept as shown in Figure 1-A. Here two centers or foci of interest are indicated. One is the individual and one is the state, and between the two is the stress line with regard to the practice of medicine; and it is pull devil, pull baker, as to which center will occupy the commanding position.

I would rather look at the situation in this fashion: I would rather think of three centers of medical policy or interest, and I would diagram my concept in this way (Fig. 1-B). In this diagram I place *three* centers, representing three different forces in medicine and in theories of medical care, somewhat bound together.

The first center would be the one that is ordinarily called individual or private medicine. I am inclined to take the position that, economically speaking, there has been little, if any, strictly individual medicine for over a century. The battle with respect to strictly economic individual medicine was settled in England and France about the middle of the Eighteenth Century. So I will call this center not individual medicine but guild medicine.

How does guild operation differ from the operation of an individual? Very strikingly. Let

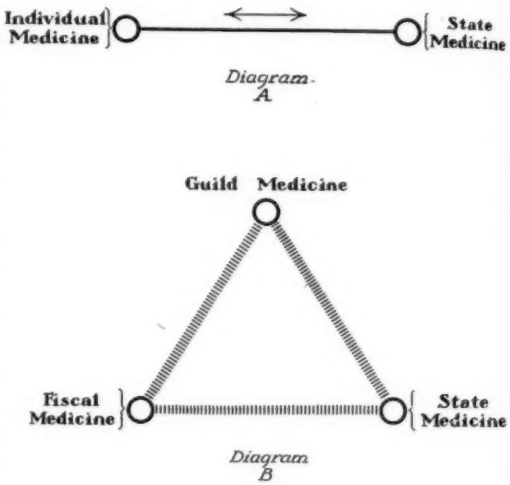

Fig. 1.

us note a few of their differences. A physician does not advertise. An individual in private competitive business advertises freely; it is honorific; it is a recognized form of competition; and few raise their voices against it. As a matter of fact, the individual in business is often complimented for his acuity in the type of advertising he employs. If medicine were an individual instead of a guild relationship, there would be any amount of advertising that the individual cared to do.

Second, in a guild the arts and technics employed are free to all members of that guild. This condition certainly applies in medicine. If a surgeon discovers a method or technic of an operation, does he conceal it? He does not. He publishes it. He gives it to his colleagues, he trains them in its use. If an internist, we will say, develops a better method of administration of insulin, does he conceal it as a trade secret? Not if he does not wish to be ostracized. He publishes it. He communicates it to his col-

*Presented at the Conference to discuss the Majority Report of the Committee on the Costs of Medical Care, under the auspices of the Minnesota State Medical Association, Minneapolis, December 18, 1932.

leagues. It is immediately made free to the profession. If a better method of controlling thyroid diseases is devised, it is equally made free. Yet in private or individual enterprise the patenting of processes is a highly legitimate procedure. In fact, it is specifically provided for in the first article of the Constitution of the United States. We pay some five and a half million dollars a year to maintain a Patent Office, so that individuals may hold the right of their specific discoveries over long periods. Here is an utter difference in economic attitude of the guild from that of the individual.

The guild does not hesitate to train younger members, but an individual in private enterprise may and frequently does very carefully protect his technological processes, particularly in very elaborate chemical practices. He very frequently hires people who are concerned with only certain steps in those processes, while he guards other stages from their knowledge. This is recognized as an honorable procedure.

A physician who is a member of the guild and lives by its precepts is very careful of the ethics of receiving patients formerly under the care of another physician. He inquires in detail whether some other doctor is engaged by the patient before he offers his services. Thus, according to the ethics of his guild he limits his competition by a definite code of conduct. Yet in individual enterprise it is usually recognized that "competition is the life of trade" and that this competition is entirely respectable and proper so long as it remains within the limits of the law.

So you see that from an economic point of view the guild is entirely a different thing from the individual. The real fight in which the guild maintained its original structure occurred about 150 years ago. At that time many physicians made their own prescriptions, kept them entirely secreted in their prescription books, and regarded them as personal property.

The guild in medicine was part of medieval society, and it is centuries old, so that our distinguished presiding officer is really a spiritual descendant of the master of the long robe who 500 years ago presided over a guild.

Why is it that the guild form has remained in medicine while it has disappeared from most other forms of human activity? Remember that 500 years ago most human affairs, when conducted in communities, were organized in the form of guilds. Today medicine and the related subjects are perhaps the only forms of human activity that are organized in guilds or, as we call them, organized professions.

What has made it possible to carry the guild through this period of some five centuries? Let us think of some of the epochal changes in society that it survived. It passed through the Reformation, and in England the Dissolution. It passed through the commercial revolution of about 1600. It passed through the industrial revolution which occurred from 1750 to about 1830. Yet throughout these changes it kept much of its original form.

I take issue with my distinguished colleague of this afternoon, who apparently thinks of the guild form as being something which is rather outworn, and that we are now facing a crisis that is different or greater than any crises that society has met before. The crisis which we face today is great; but is it, for example, greater than the crisis that we call the Reformation? Consider a period in which a country like Germany was decimated by civil war over a period of twenty years. Consider a period at the same time when a country like England saw the forcible changing of hands of perhaps one-fourth of the entire property in five years. The guild lived through this. Consider again the industrial revolution, which fairly roared through Europe. There is hardly a social structure remaining to us which was not profoundly modified by the industrial revolution. But medicine has gone on in the guild form.

Can this have happened simply through the force of tradition? If so, why did not tradition protect other guilds? My own surmise is that the guild of medicine has lived for two rather vital reasons. The first and by far the more important of these is that the members of the guild have an essentially personal relationship with their clients. This close relationship rarely exists elsewhere, except possibly in certain relationships of the church. This idea of the importance of the personal relationship was inherent in the society in which the guild of medicine took its origin.*

A great many physicians drop in to see me in

*"Dr. Cunningham draws attention to the fact that the existence of such a universally received code of economic morality was largely due to the comparative simplicity of the mediaeval social structure, where the *relations of persons* were all important, in comparison with the modern order, where the *exchange of things* is the dominant factor."—George O'Brien, *An Essay on Mediaeval Economic Teaching*, 1920, Chapter 1, page 10.

my office, and I have made point in recent months of asking them, "How much of your work is technical, and how much of it is acting in the capacity of advisor or counselor or confessor?" The figures for the latter function generally run from about 25 to 45 per cent. So I think that the fundamental, personal, psychological relation is one chief factor that has kept the guild alive.

The second element which seems to me to have been vital to the guild is the fact that each medical problem is a biological problem and therefore does not permit the codification and pricing that is characteristic of modern business procedure. Doctors are sometimes criticized because they will not at the beginning of a disease or preceding an operation set a fixed fee. I have a friend who deals in coal, who made such a criticism the other day. I said, "What would be your position if you dealt with coal in an expansible wagon which might contain five tons by the time it arrived at the consumer's door or might contain half a ton?" Each medical problem is a biological one, and there can be no precise estimate of its complexity until after the problem is solved.

Let us consider briefly what a guild tried to do and how far the profession of medicine follows this process. A medieval guild really had three main functions. The first function that it performed was to protect its members from being exploited by each other, and to protect the guild as a whole from being exploited by non-conscientious persons on the outside. Certainly, medicine has been able to carry out this function, humanly speaking, very well. It is carrying out this function when it builds up taboos against advertising and other similar procedures.

The second thing that the guild did was to improve its services. Every medieval guild made this attempt. I have given an instance on occasion. For example, a brewer in medieval days was a member of the brewers' guild. If he made bad beer, the master brewer was compelled to drink one quart of the beverage and then was soused in the hogshead.

Does not medicine improve its services? It seems to me that medicine is also carrying out the second function of a guild as well, humanly speaking, as an organization can. As we all know, the information is exchanged, young men are trained, professional advances in technic are not kept secret. The relation of patients with respect to the practitioner is maintained.

The third function that a guild performed was the rigid control of its membership. If any place, this is the place where medicine, it seems to me, has failed as a guild. Not that it does not examine its members when they enter; but even before the process of education of physicians passed largely to endowed or state institutions, the membership had really commenced to grow beyond the necessities of society and the necessities of the guild.

In this country, part of this situation is probably associated with the general shift in employment. In the year 1820, roundly 3 per cent of the gainfully employed in the United States were engaged in professional services. One hundred years later, in 1920, approximately 5 per cent were engaged in professional services. Thus there had been a gain of 2 per cent of the working population in professional services over a period of one hundred years. In the year 1930 approximately 7 per cent of the gainfully employed were engaged in professional services, not necessarily medical but some form of professional services. In other words, the relative change has been as great in the last decade as it was in the whole hundred-year period between 1820 and 1920.

This seems to be reflected in the character of our education. In the last ten years the number of persons entering college has increased about 100 per cent. The number of individuals entering secondary schools has increased about 10 per cent, and the number of children entering primary schools has increased about 3.5 per cent. The proportion of these college students who plan to enter a profession seems to be steadily mounting. So we are facing, in the over-crowding of medicine, a movement which is taking place in all professional activities.

I have labeled the first center in my diagram "guild medicine." Some other name should be used for the other two centers. For want of a better term, I shall give to one the name "fiscal medicine"—and I use the term "fiscal medicine" in the sense of medicine which is conducted with an intermediary, or a person engaged in finance, between the physician and the patient, that is someone who controls the situation from a financial point of view. And I shall label the third "state" or "social medicine."

Let us consider briefly the status of fiscal medicine. It has already been discussed several times

today. I should like to point out, however, one or two characteristics regarding it which I think may be of interest to you. Is fiscal medicine, medicine on a business basis in which the business man runs it, going to be a success? Mr. Filene, whose name has been mentioned several times today, thinks so. I have just finished reading a paper in which he roundly berates the doctors because of their lack of ability to place their functions on a business basis. His remarks are as follows:

"Today we are witnessing the paradox of a nation starving for medical care, while ample facilities for this care are at hand. This touches a more personal point: the doctor's pocketbook. It is not unreasonable to say that doctors work as hard as any class of business men. Why do we find, then, that the average physician's income is barely in excess of $5,000, although seven years of intensive study and a capital investment of, say, $20,000 is required to enter the medical profession?

"In our scientific research we are quite abreast of other countries. Our hospitals are well staffed. With an A-1 product to sell—HEALTH—this slackness of sales shows only one thing: absence of proper organization within the medical industry."*

Mr. Filene is a retail merchant. I have often passed his store on Washington Street in Boston. I would feel much more enlightened if Mr. Filene would tell us how he is able by business methods to supply with footwear the mass of people needing shoes, but without funds, who trudge past his store in the slush of Washington Street.

One of the greatest weaknesses in fiscal medicine is this: Most fiscal medicine is placed on a voluntary insurance basis. There are in this country between sixty and eighty great insurance companies, as well as a large number of smaller ones. They form one of our best organized and most intelligent forms of corporate activity. The oldest of these companies has been soliciting business for over one hundred years. If there is any device, any appeal to one's pride, cupidity, prudence, or any other quality of human nature which has not been played upon by an insurance solicitor, I have yet to hear of it.

Most of this insurance has been for what purpose? It has been for protecting against the one great certainty—death. But illness is not a certainty; it is a possibility or, at most, a probability. How successful have these great and well-organized corporations proved in covering this risk of a certainty? It is said that one-eighth of the insurable people in the United States are insured today, and one-eleventh of the insurable people in the state of Minnesota are insured today. Roughly speaking, then, all of these devices for voluntary insurance seem to work down to covering about one-tenth of the population. They provide protection for the provident.

This lack of spread of insurance against misfortune might be avoided by making insurance for medical care *compulsory* instead of voluntary, and this program has been suggested. However, it is hard for a layman to distinguish between compulsory insurance and taxation. *De facto* such a contribution *is* taxation, although I am assured by good legal authority that *de jure* it would be regarded as exercise of police power. I will consider sickness protection by taxation in another point of this paper.

The second point I would make in connection with fiscal medicine is this: Fiscal medicine, in the sense I am using it, means that the financial control of medical practice will lie in the hands of somebody else than the doctor. It is my general observation, as a realist, that he who holds the pursestrings holds the power; and while, if the doctor and the entrepreneur were engaged in combat, my sympathies would be all with the doctor, were I to place a wager, it would be on the entrepreneur.

These two great weaknesses, then, seem to lie in fiscal medicine. As a matter of fact, the general experience has been that the occupation of protection against disease, when it moves away from the guild form, goes first to some fiscal form and then moves to some state form. This process happened in England. When the Lloyd George Medical Bill was passed, few if any more people were protected at first than had been protected under the Friendly Societies which had previously existed. This group was taken over and later greatly increased. This was really a movement, I would say, out of the fire into the frying pan.

Let us regard the third possibility, or state medicine. A great deal has been written about the characteristics of state medicine. I shall not attempt to go over these with you. They have been described to you at some length.

I would point out that, quite aside from the character of state medicine, there exist certain

*From "A Merchant Looks at Medicine," *Medical Economics*, November, 1932, 10:17-18.

economic phases of the subject, and I would like to diagram them for you. According to the Committee on the Costs of Medical Care these costs to an individual may be estimated as somewhere between $20 and $40 a year. Let us take the same order as pensions or the same order as war debt charges and payments, or considerably more than the cost of our entire military establishment, army and navy, or approximately two-thirds of all the rest of the government costs together.

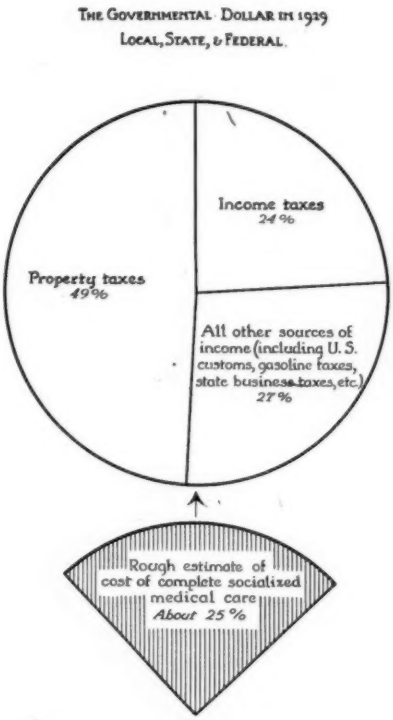
THE GOVERNMENTAL DOLLAR IN 1929
LOCAL, STATE, & FEDERAL
Income taxes
24%
Property taxes
49%
All other sources of income (including U.S. customs, gasoline taxes, state business taxes, etc.)
27%
Rough estimate of cost of complete socialized medical care
About 25%

Fig. 2

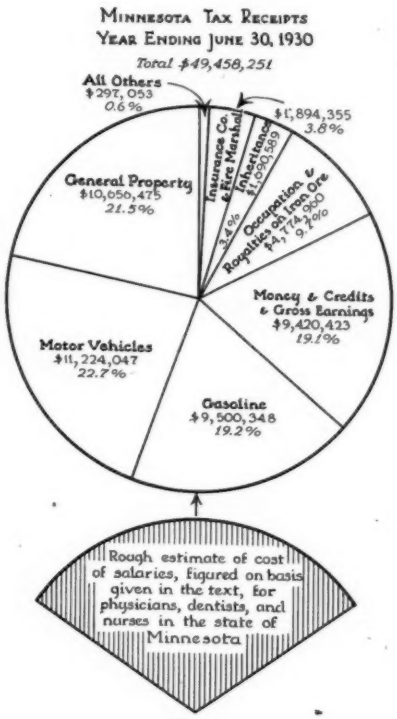

Fig. 3

median figure of $30, which seems to be fair. All forms of government in the United States are said to collect in the form of taxes about $116 per person. Then roughly, 25 per cent of the now estimated tax collections of the country would be required for operating social medicine if carried to everyone on the basis of the median figure of the cost of medical care.

With this in mind, let us examine the expenditure of the federal tax. About 27 per cent goes to pensions. About 29 per cent goes to interest and payment of principal on our war debt. Somewhere in the neighborhood of 16 per cent goes to maintenance of our military establishment. The remaining sum goes to support all other functions of the federal government. If, then, we think in terms of the federal government expenditure, we must estimate the cost of complete state medicine as requiring a sum of about the

Let us look for a moment at where the federal and *all other governmental divisions of the country* get their dollar (Fig. 2). Approximately 49 per cent of the dollar comes from all property taxes. Approximately 24 per cent is derived from the income tax, and about 27 per cent comes from all other sources, including customs, gasoline taxes and a number of other items. So if you wish to consider medical costs in these terms, you must think of complete socialized care as costing a sum equal to about half of the property taxes of this country or to about the total sum of income taxes, or nearly all other sources of income except property or income tax.

Let me turn a little closer to home. Let us think about our own state (Fig. 3). Minnesota has a population of about 2,500,000 people. It is probably fair to say that under such a system as advocated, there would certainly be 40 per cent of

our population that would be eligible to socialized medical care. Forty per cent of 2,500,000 people is 1,000,000 people. Twenty dollars per person is $20,000,000, which is somewhat over one-half of our proposed taxes for this state for the next year and somewhat over one-fifth of the receipts of all state funds for the fiscal year ending June 30, 1930.*

If you care to examine the problem another way, let us look at it in terms of the persons who are now engaged in medical care in this state. There are upwards of 3,000 doctors. Certainly we should not pay our doctor less than $2,000 per year. That would be $6,000,000 for the 3,000 physicians. I will leave out the 1,000 cultists for the time being, but there are about 2,500 dentists and they certainly ought to be paid at least $2,000 per annum, so we put those in at $5,000,000. And there are perhaps 6,500 registered nurses. I think we ought certainly to allow them $50 a month. That would be about $3,600,000. We have thus built up for professional care a sum of $14,600,000 before we have commenced to pay technicians, hospitalization, medicine and overhead on equipment. I think these figures indicate pretty definitely what a perfectly terrific public obligation is implied in complete social medicine under our present fiscal system.

Let us return again to the little diagram I made of the three centers, with the centers of guild medicine, state medicine and fiscal medicine. I have indicated there were bonds between them, that they run across and it is not possible to draw a perfectly sharp line between. Does there seem to be any sort of compromise which is really an effective one? In my opinion, the most effective one which has been found abroad has been one of coöperation of the state with the guild of medicine where the guild controls, in fact, the professional situation. This one finds to a fair degree, it seems to me, in Norway and in Sweden. But remember that these are countries that work under very peculiar conditions. There is one medical school in Norway; there are three small medical schools in Sweden. The number of students that enter these schools is controlled, and it is controlled very rigidly. Men wait for a very long while before completing their medical training. They undergo an exceedingly severe selection upon entering. There is little possibility of inflow of physicians from the outside, both on account of the legal qualifications and on account of the extreme language difficulty. Remember also that these countries have a society which is very highly stratified and one that is accustomed to complex social organization to an extent that we can hardly appreciate.

I have sometimes cited in this connection the liquor control situation in Sweden in comparison with the handling of this vexing question in the United States. In Sweden, the liquor situation seems to be excellently controlled. But it is handled by a social organization which is so complicated, so elaborate, and depends so much on respect for law, for moderation and for authority, that it is practically inconceivable that it could be worked here. Similarly, it is my opinion that any exact copying of any scheme of social medicine such as those used abroad is open to great question in our own country.

I have put a situation before you. I have offered no solution, for I have none. It seems to me there are two things which might be suggested as possible palliative measures and one which seems to me as an absolutely essential measure under any form of medical practice. The two palliative measures are these: First, any system of medicine can hardly continue to hold its high standards if it is flooded with unnecessary members, even though these be persons of high character and ability. Most people do not seem to realize that in this country the growth of population is decreasing very rapidly, and that as a matter of fact (and here I do agree with my distinguished colleague, Dr. Chapin) within less than a generation we will approach a stationary population. Indeed, we are approaching it very rapidly in certain areas now. We are producing medical men, and have been for the last decade, at a relative rate which is between five and seven times as fast as the population is growing, and we are registering physicians in this state at a rate of nearly three times as fast as the population is growing. As I have said to a number of you before, for every 400 new citizens added to this state, there is a new physician who locates here. Certainly this situation must eventually be controlled, both for the good of the public and for the good of medicine. In my opinion, that control can only come through the close coöperation of organized or guild medi-

*Quoted by permission from Minnesota Year Book, 1931, League of Minnesota Municipalities, page 63.

cine, the medical and basic science boards and through the institutions engaged in medical education.

The second palliative measure is, as was pointed out this afternoon, the fact that the physician should receive some compensation, at least, for the charity work he does. It certainly is not just to pick out one class in society and require it to donate all services to people who cannot pay for them. I do not mean to say that each physician can be paid in the style to which he is accustomed, but at least something possibly can be done that way.

But primarily, it seems to me, the thing to do is to keep, strengthen and make firm your guild organization. As I have said, it has existed for 500 years. It has gone through the Reformation, it has gone through the commercial revolution, it has gone through the industrial revolution. It has proved its strength. Certainly those crises were as great as the one we face today. This, it seems to me, is the primary point in any program that you may adopt.

One word in closing. I was put down in the preliminary program of this meeting to speak on the relation of the University Hospital to the medical profession of the state and the practice of medicine. I think I ought to say a word about this subject. In doing so I want you to realize that I am a scholar gone wrong as an administrator, and that the opinions I express are my personal opinions because I am a recommending officer and not a directing officer of the University. Therefore, the views I express are only my individual conclusions.

It is my feeling that the University of Minnesota Medical School exists to train medical men to fill the gaps as men leave the profession or leave the state. In other words, to provide a supply of physicians. Second, to coöperate with physicians in the field. Third, to advance medical knowledge.

These are our three primary functions. In order to perform certain of these functions, it is necesary for us to be in contact with patients, and in my opinion our hospital exists primarily for that function. In so doing we must and will give those patients the very best possible service.

In times like the present we must do anything we can to help out the indigent, but we do it as part of our three primary functions: training the young physician, coöperating with the physician in the field, and advancing medical knowledge. We are then, in my opinion, not primarily a service institution in the sense of rendering the service that is required for all the indigent. We are a service institution to the extent to which we take care of the people in our hospital.

I take that position on two grounds. In the first place, if our function is to train those who are to take care of the ill, well-to-do or needy, certainly to take over the function of general medical care after we have trained other people to do it seems to be somewhat of a logical absurdity.

Second, our hands are quite full enough with the task that has already been placed in them.

SOME UNUSUALLY LARGE GALLBLADDERS: A CLINICOPATHOLOGIC STUDY*

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and
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NOT long ago a woman presented herself at The Mayo Clinic because of a large tumor in the right upper quadrant of the abdomen. Examination and operation proved this to be a gallbladder measuring 20 by 10 by 10 centimeters. The history of the case did not suggest disease of the gallbladder. Even questioning the patient again after operation failed to disclose any history of pain, intolerance to food, or gaseous distention. The huge size of the organ and the fact that it had become so without causing symptoms prompted a search of the records of the clinic to see if this were a rarity.

The pathologic records of all the gallbladders which have been removed at the clinic (about

*Submitted for publication September 15, 1932.

18,000) between 1906 and 1932 were examined. Records of gallbladders measuring 15 cm. or more in length were studied, and the pathologic changes, the presence or absence of stones, and particularly the presence or absence of blockage of the cystic duct were noted. There were fifty-five cases in which the gallbladder was 15 cm. or more in length. The records of these cases were studied in reference to: (1) a palpable tumor; (2) a clear history of disease of the gallbladder; (3) the presence of symptoms other than those of the tumor, and (4) a history of jaundice. The results of these studies are shown in the tabulation.

In thirty-five of the fifty-five cases a clear history of disease of the gallbladder was obtained. By this is meant that the histories were sufficiently typical so that the examiner was able either to make an outright diagnosis of disease of the gallbladder or at least to suspect it strongly at his first examination without the aid of laboratory data. In sixteen the history of disease of the gallbladder was fairly clear, and the presence of a lesion was suspected, but the history was atypical and further study was required, especially roentgen-ray examination, to confirm the diagnosis. In two cases data concerning the gallbladder were obscure. In one of these cases the patient had symptoms of chronic nervous exhaustion, and the examination of the gallbladder was apparently almost accidental. In the other case the patient was "ailing" and attention was directed to the gallbladder by the presence of a palpable tumor in the right upper quadrant of the abdomen. The remaining two patients did not have symptoms suggestive of disease of the gallbladder; one of them complained of a large tumor in the right upper quadrant of the abdomen and the other had a goiter and the condition of the gallbladder was discovered at examination made as a routine. In both of these cases the gallbladder was very large, one being 20 by 10 by 10 cm. and the other 20 by 6 cm. It is hardly conceivable that the gallbladders should become so large without causing pain or symptoms (Figs. 1 and 2).

In thirty-eight of the fifty-five cases the tumor could be definitely felt and in three others a palpable tumor was questionable. The larger the organ the more often it was felt, as would be expected; the seven gallbladders which were 20 cm. long all were palpated, whereas only fifteen of the twenty-four measuring 15 cm. were palpated. In many cases the mass palpated was diagnosed as the gallbladder without question, especially when a clear history was obtained. In other cases, however, normal kidney, tumor of the kidney, Riedel's lobe, tumor of the colon, pancreatic cyst, and desmoid were diagnosed. In eleven cases the presence of the tumor was the chief complaint.

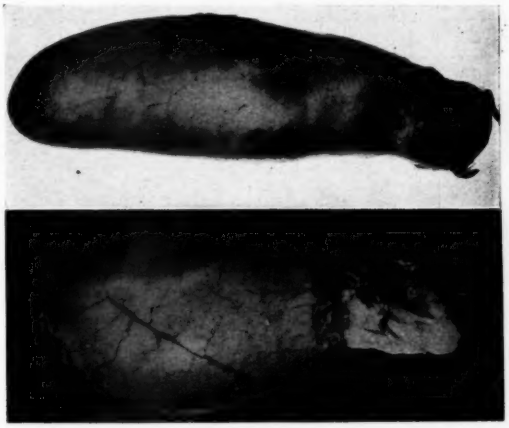

Fig. 1. *(Above)* Gallbladder that measured 20 by 6 cm.
Fig. 2. *(Below)* Gallbladder that measured 20 by 10 by 10 cm.

In fifty-four of the fifty-five cases gallstones, single or multiple, were found. In the other case, stones had been removed from the gallbladder elsewhere six years before; the organ had been drained by bringing the fundus up under the skin. This accounts for the absence of the stones in this case when operation was performed at The Mayo Clinic, and the former presence of stones may have accounted in part for the length of the organ (19 cm.).

In thirty-four cases one or more stones were found impacted in the cystic duct or in the ampulla of the gallbladder. It seems likely that this condition had been present in other cases at some time. Possibly in some cases an impacted stone had been dislodged by the surgeon in his manipulations without his knowledge, or if noted he may have omitted it in the surgical notes. It may also have passed spontaneously into the common bile duct or back into the gallbladder.

In only four cases was there a history of jaundice; in one case there was a question of

SUMMARY OF DATA

Size, cm.	Cases	History				Chief complaint, tumor	Palpable tumor	Stone	Stones in cystic duct	Jaundice	Pathologic change	Comment
		Good	Fair	Poor	None							
20	7	2	3		2	1	7	7	4			
19	4	3	1			2	3	3	3		1 subacute	1 patient was operated on before
18	6	5	1			1	3	6	3	1(?)	1 subacute	
17	7	5	2			2	4	7	4	1	1 acute	1 patient had stones in common bile duct
16	7	4	3			2	6(1?)	7	7	1	1 acute	
15	24	16	6	2		3	15(2?)	24	13	2	5 subacute 3 acute	1 patient had stones in common bile duct
Total	55	35	16	2	2	11	38(3?)	54	34	4(?)	7 subacute 5 acute	

slight jaundice on one occasion. In only two cases were stones found in the common bile duct.

The condition in almost all of the cases was chronic cystic cholecystitis with cholelithiasis. In seven cases the condition was subacute and in five acute, usually superimposed on chronic cholecystitis. In one case carcinoma of the cystic duct was found.

CONCLUSIONS AND SUMMARY

This group of unusually large gallbladders includes all gallbladders measuring 15 cm. or more in length removed at The Mayo Clinic. Fifty-five such gallbladders were found in more than 18,000. The significance of the presence of gallstones in the formation of these large organs is shown by the fact that in fifty-four of the fifty-five cases stones were found at operation at the clinic; in the other case stones had been removed elsewhere. Impaction of the cystic duct was found in thirty-four of the fifty-five cases; it is suggested that actually it was present in a larger number at some time, the stone having been displaced, or having been passed spontaneously through the duct, or it had slipped back into the gallbladder.

In most cases symptoms were elicited, but in two cases in which the gallbladder was 20 cm. long, the patient had no complaints referable to the organ. Jaundice was uncommon.

HYPOPLASIA OF THE AORTA AS A POSSIBLE CAUSE OF CARDIAC FAILURE*

REPORT OF CASES

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HYPOPLASIA of the aorta has rarely been recognized in recent years as a cause of serious cardiac decompensation. Probably not more than ten cases have been reported during the last twenty-five years and today it is scarcely mentioned either by the clinician or the pathologist. It seems evident that the condition has been practically ignored as a cause of cardiac disease by the conservative opinion of the contemporary medical world. It is of interest, nevertheless, to appreciate the fact that some 100 cases were reported in a period of nearly 150 years, extending from 1761 when Morgagni described the first case to 1907 when von Ritook[1] wrote his paper, the last of the several notable

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contributions, on the subject. Critical study of many of these reports reveals, moreover, that cases of aortic hypoplasia uncomplicated by coexisting major lesions and terminating in evident cardiac death, are relatively uncommon and constitute a distinct and interesting clinical and pathological group which should deserve further study by the student of medicine.

Attempt will be made to reintroduce hypoplasia of the aorta as a possible cause of fatal cardiac decompensation among young individuals, by reporting four cases with necropsy findings and by advancing the cardinal diagnostic criteria of this condition through a brief review of the literature.

DEFINITION

Hypoplasia of the aortic system is defined by Maude E. Abbott[2] as that condition in which "the lumen of the arterial vessels in the greater circulation remains abnormally small and the walls unusually thin and elastic." She adds further that "although there has been some debate as to the pathological significance of the condition, it must be given a place in the pathogenesis as one of the special causes of cardiac disease." The condition was variously designated by such terms as "Unnatural narrowness of the aorta" (King, 1841), "Constriction of the aorta" (Hutchinson, 1879), "Congenital narrowness of the aorta" (Kuhleukampf, 1873; Kuessner, 1879), "Stenosis of the aortic system" (Frantzel, 1888), "Congenital uniform stenosis of the aorta" (Ortner, 1891), "Congenital stenosis of the aortic system" (Spitzer, 1897), "Congenital narrowness of the aortic system" (Burke, 1901-02), "General narrowness of the aortic system" (Apelt, 1905), "Hypoplasia of the arterial system" (von Ritook, 1907), "Aortic Hypoplasia" (Werley, 1927), "Hypoplasia of the Aorta" (Philpott, 1929).

Burke[3] in his classical articles published in 1901 and 1902, states that "the occurrence of phenomena with this finding (a general narrowness of the aorta) which cannot be otherwise considered than as a circulatory disturbance, as well as the discovery made by the early authors that this affection often leads to hypertrophy of the left heart, must bring us to the conclusion, though contrary to the reported views of other authors, that through a general narrowness of the aorta, a series of resulting circulatory phenomena, particularly in the heart, are caused." He, like many others, however, failed to determine the limits within which the measurements of the aorta must fall, before a diagnosis of hypoplasia can be established. He simply states that "it must be left to the individual observer, whether, in a case in question, the vessels were narrow or not." This opinion was apparently shared by the majority of the earlier observers in making the diagnosis of hypoplasia of the aorta. Many of them failed to state the exact measurements of the aorta which they reported as hypoplastic. This ambiguity in the anatomical definition of this condition which has led to the very wide discrepancy, among observers, as to its incidence; the introduction into the discussion, of the various types of hypoplasia of the aorta with or without cardiac involvement; the consideration of possible pathogenesis of this condition and the resulting cardiac failure, and the fact also that there have been in our routine necropsy practice frequent instances of this condition without cardiac complication, have made it most difficult to accept the assumption that hypoplasia of the aorta, in a given case, may cause a cardiac failure and death.

NORMAL CIRCUMFERENCE OF THE AORTA

The anatomical diagnosis of hypoplasia of the aorta must, necessarily, be based upon the knowledge of the accepted figures, if any, of the normal measurements of that organ. Schiele-Wiegandt,[4] in a study of the circumference and thickness of the artery in ninety-nine human bodies, found the mean figures at various levels in eight men between twenty and thirty years of age, as follows: above the aortic valve, 6.26 cm. and 0.139 cm.; below the left subclavian artery, 4.88 cm. and 0.100 cm.; and above the bifurcation, 3.12 cm. and 0.088 cm. in circumference and thickness, respectively. Six women of the corresponding age period gave the following mean figures for the same levels: 5.55 cm. and 0.115 cm. above the aortic valve; 4.40 cm. and 0.083 cm. below the left subclavian artery; and 2.64 cm. and 0.077 cm. at the bifurcation, in circumference and thickness, respectively. Beneke[5] found the following figures in individuals between nineteen and twenty-one years of age: 5.45 cm., 4.1 cm., and 2.9 cm. in circumference at the aortic, thoracic and abdominal levels, respectively, and those between twenty-four and

thirty-one years of age, 6.00 cm., 4.3 cm. and 3.1 cm. in circumference, at the corresponding levels, respectively. Suter[6] found in men between twenty-one and thirty years of age a circumference of 6.42 at the aortic orifice, and in women 5.97 cm. Thoma[7] gave 2.24 cm. as the diameter (7.037 cm. in circumference) of the aorta at its orifice in individuals between twenty-three and twenty-nine years of age and 2.07 cm. in diameter (6.503 cm. in circumference) between seventeen and twenty years of age. Von Ritook assumed that in adults (all ages and both sexes) a narrowing below 5.5 cm. in circumference at the aortic orifice could not be compensated while a measurement below 6.0 cm. could be compensated.

From these observations, it may be conveniently assumed that, in men between twenty and thirty years of age, the aorta from 5.5 cm. to 6.42 cm. in circumference at the aortic orifice and in women of the corresponding age period, from 5.5 cm. to 5.97 cm., may be considered normal.

Figures of the aortic circumference in younger individuals were given by Suter as 5.11 cm. for males and 4.97 cm. for females between ten and fifteen years of age, and 6.10 cm. and 5.39 cm. between sixteen and twenty years of age in males and females, respectively. Beneke gave an average figure of 4.8 cm. for individuals between fourteen and a half and fifteen years of age, and 5.45 cm. between nineteen and twenty-one years of age. Thoma estimated an average diameter of the aorta to be 2.07 cm. in men and women between seventeen and twenty years of age.

It must be emphasized, however, that there is a considerable variation in the measurements of the normal aorta at various levels, in a given age and state of physical development, in both sexes, and that a hypoplastic aorta at necropsy may not be directly or even remotely related to the cause of death in a given case. Burke aptly concluded that the extent of cardiac involvement occasioned by this condition did not stand in direct proportion to the degree of aortic narrowness. Other factors such as the thinness and elasticity of the vessels, the volume of the blood in circulation, the intra-arterial pressure, physical exertion, physical development of the individual, et cetera, must be taken into consideration in the pathogenesis of cardiac failure in individuals with hypoplasia of the aorta. Herein probably lies the explanation as to why many individuals with a hypoplastic aorta do not show signs of cardiac disease nor die of heart failure.

HISTORICAL

The condition was first recorded by Morgagni[8] in 1761. He reported three cases. One was that of a thirty year old monk who died of "dropsy," and at autopsy showed an aorta with "a circumference of a finger" and a dilatation of the right ventricle. Merkel,[9] in 1768, reported the fourth case, in a seventeen year old girl who had frequent attacks of palpitation and in whom autopsy revealed a hypertrophy and dilatation of the heart, consequent upon "a congenital narrowness of the aortic system." Merkel was said to be the first to recognize the abnormal narrowness of the aortic system as a cause of cardiac hypertrophy. Nearly 70 years later, in 1837, the fifth case was reported by Hope[10] in a twenty-eight year old male of robust build but of a pale and tender complexion, who complained of palpitation, orthopnea, cough and slight edema of feet and pain in the cardiac region and who died from a typical cardiac failure. Autopsy showed a dilatation of both ventricles without hypertrophy of their walls, enormous dilatation of the right auricle, insufficiency of the mitral valve and "a remarkably narrow aorta." During the subsequent seventy years, nearly 100 cases were reported in the literature. Burke[3] in 1901 and Apelt[11] in 1905, reviewed the literature thoroughly and added detailed reports of their own cases. Von Ritook,[1] in 1907, reported on the result of the analytical study of seventy-three cases, fifty-three of which he collected from the literature and seventeen from his own laboratory. Since 1907, no important contributions on the subject have been made, only few brief reports on isolated cases having been recorded in the literature. G. Werley,[12] in 1927, was the last to publish a typical, uncomplicated case of hypoplasia of the aorta with death due to cardiac failure. His case, a young woman of twenty-two years of age, presented a clinical picture which, in many ways, closely resembled one of the cases to be reported here. Philpotts'[13] case, reported in 1929, may be regarded as the last contribution in the literature, except for the fact that it was complicated by an advanced stenosis of the mitral orifice due to an old rheumatic

disease, which, in itself, might easily be an important etiological factor in the production of the underdevelopment of the aorta in a growing young woman of seventeen years.

ETIOLOGY

In a series of 14,305 autopsies, recorded in the department of pathology of the University of Minnesota, prior to 1930, there were eight cases of aortic hypoplasia listed as a major anatomical diagnosis, all of which, curiously, were recognized prior to 1916. Six occurred in individuals twenty to twenty-six years of age and two at thirty-five years of age. Five showed a hypoplastic heart (136-210 grams) and two, a slight hypertrophy of the ventricles. One case occurred in association with perforation of the interventricular septum. None of the eight cases had any bearing upon the cause of death. Not a single diagnosis of this condition was made in a series of 11,451 autopsies between 1917 and 1930. This is significant.

Von Ritook[1] found fifty-seven cases showing an arterial hypoplasia in 395 autopsies, or a ratio of one such condition in seven or eight autopsies. This is the largest incidence of this condition recorded in the literature. Cabot[14] found nineteen hypoplastic aortas in 1,846 autopsies or one in ninety-seven; ten of them occurred as the only cardiac lesions and nine with other lesions. Of the 1,145 autopsies showing a single cardiac lesion, he found fifteen hypoplasias of the aorta, ten without cardiac hypertrophy and dilatation and five with such hypertrophy and dilatation. He failed to elaborate on this condition as a possible cause of cardiac disease. Paul White[15] states that hypoplasia of the aorta is "probably the commonest of the congenital aortic anomalies, but in high degree, it is relatively rare and it is then usually associated with other congenital cardio-vascular defects." Maude E. Abbott[16] writes that she has never personally seen a pure uncomplicated case of hypoplasia of the aorta but mentions several instances in association with other major lesions of the heart. In a study[17] of 200 recorded cases of coarctation of the aorta, she reported, as an associated finding, twenty-one cases (10 per cent), of hypoplasia of the aorta, ranging in circumference from 5.0 cm. to 6.5 cm. in males and from 4.6 cm. to 4.8 cm. in females, above the aortic leaflets.

Etiologically, Burke[3] divides the cases into two groups: (1) those of the purely congenital origin or due to an error in the embryological development of the organism; and (2) those attributed to the arrest or retardation of the growth of the arterial system from unknown causes, during the formative period of adolescence.

The theory of the congenital or intra-uterine origin of this condition was first suggested by Rokitansky[18] in 1839. He observed a certain causal connection between the lack of development of the genital organs and the general narrowness of the blood vessels. Such other congenital defects as hypospadias, incomplete closure of the inguinal rings and various developmental anomalies of the heart and, less frequently, of other visceral organs, have been reported in association with this condition. A few other investigators have observed the condition in individuals possessing the so-called thymico-lymphatic constitution. Philpott's[13] case was the most recent and outstanding of the examples illustrating this alleged association. Delafield[19] states that "it is apparently a congenital defect and while not limited to well defined cases of lymphatic constitution, appears in this connection." It is of interest to recall that in the seventy-three cases collected by von Ritook, there was only one case complicated by a congenital anomaly and this was in the form of a defect in the interventricular septum.

Most recorded cases have been unassociated with congenital defects, or with the tendency to the thymico-lymphatic constitution. The condition has occurred in young adults often with robust health and well developed musculature and perfectly normal genitals. Cardiac weakness became manifest, as a rule, for the first time, rather suddenly, immediately following exertion or an infection. Of the eighteen cases of cardiac decompensation caused by arterial hypoplasia, carefully studied by von Ritook, ten were characterized by an especially well developed body structure and considered themselves absolutely healthy and were engaged in strenuous physical activity, nearly up to the appearance of severe cardiac symptoms. In only five of these, was there a history of the first subjective symptoms appearing prior to the severe physical exertion. It would appear that a sudden arrest or retardation in the growth of the arterial system, in an otherwise healthy and rapidly growing individual, probably brings about a sudden circulatory

over-loading and unbalance which eventually results in cardiac failure.

Of the sixty-seven autopsied cases of von Ritook,[1] twenty-one occurred between the ages from ten to twenty-one; thirty-one from twenty-two to thirty-one years; two from fifty-three to fifty-six years and one at the age of eight. In other words, fifty-two of the sixty-seven cases (77 per cent) of the series occurred in individuals between ten and thirty-one years of age. The condition may, therefore, be said to be essentially and predominantly, if not exclusively, a disease of youth. In the same series, thirty-six cases were males and twenty-six females.

After a careful analysis of nearly 100 cases reported up to 1901, Burke[3] further proposes the following classification of hypoplasia of the aorta.

1. Hypoplasia of the aorta with the so-called blood diseases such as chlorosis (Virchow), pernicious anemia, hemophilia, purpura hemorrhagica.
2. Hypoplasia of the aorta in connection with infectious diseases as a predisposing or exciting factor in the fatal termination.
3. Hypoplasia of the aorta in association with the general dystrophies such as acromegaly, dwarfism, etc.
4. Hypoplasia of the aorta as an exciting cause of, or presenting a picture of, a heart disease.

Cases representing the first three groups are omitted from further discussion.

CLINICAL DIAGNOSIS

Cases which constitute the fourth group present, as already sketched, a clinical picture of a cardiac disease, resulting in failure and ultimate death. These cases belong in the second of the etiological group proposed by Burke and occur in young, healthy individuals, due to the arrest or retardation of the growth of the arterial system from unknown causes. Clinically, the diagnosis is extremely difficult, if not impossible. Fraentzel,[20] in 1872, was the first to make a clinical diagnosis of hypoplasia of the aorta which was proven by postmortem examination. Both of the cases reported by Apelt[11] in 1905 were clinically diagnosed by Lenhartz. A few cases have been diagnosed as a congenital disease of the heart. Runneberg[21] in 1890 ventured a diagnosis of idiopathic hypertrophy of the heart. The outstanding feature of the disease, common to many of the well studied cases, is the practical absence of the clinical and physical signs which may be considered pathognomonic of a known cardiac lesion.

Fraentzel's case was that of a man, thirty-four years of age, well developed in build and musculature, who showed considerable edema and dyspnea when first seen. Temperature was 36.9°C, pulse 114 and respiration 28. There was some coughing with expectoration of a blood-tinged sputum. The apex was in the sixth intercostal space, 2.5 cm. out of the left mammary line. Signs of aortic insufficiency were present. Both the second aortic and second pulmonic sounds were accentuated. The radial, carotid and femoral arteries were narrow, tense and thick walled. The liver was negative. Since the age of fifteen, the patient had suffered from palpitation associated with dyspnea. There was no history of rheumatism. The patient was admitted on September 19, 1872, with a diagnosis of congenital stenosis of the entire aortic system. He was readmitted on November 2, 1872, with symptoms more exaggerated and died on December 1. Autopsy revealed the heart enlarged, the ventricles being hypertrophied and dilated. The lumen of the aorta was extremely narrow and its intima showed a high degree of diffuse sclerosis.

Fraentzel made the following comments, "In a number of cases, we have to deal with congenital narrowing of the lumen of the aortic system which leads to no symptoms early in life and which is compensated by hypertrophy of the left ventricle. The hypertrophy becomes more and more pronounced and sooner or later becomes combined with a dilatation. Gradually, there develops the first compensation disturbances, especially when, with the progress in years, more stress is placed on the left ventricle. Death follows sooner or later as a result of the disturbances in compensation."

Apelt's first case was a young man, twenty-one years of age, medium sized and normally developed, who had been engaged in hard labor for several years. His illness began with pain in the upper abdomen, cough, and shortness of breath. He was cyanotic and the skin slightly icteric. The heart was not enlarged. The cardiac sounds were pure and soft. The second pulmonic sound was very loud. The pulse was very small, easily

compressible, irregular and 112 per minute. The liver extended one finger's breadth below the costal margin. The urine was negative. The cyanosis persisted. The pulse was poor, blood pressure 60. There was a slight rise in evening temperature. There were occasional attacks of dyspnea. The edema was increasing. Later, the cardiac dullness extended two fingers' breadth beyond the sternal border on the right. The sputum became hemorrhagic. The heart sounds remained pure. Because of the age of the patient and because there were no signs of valvular disease and because digitalis gave no results, Lenhartz ventured a diagnosis of possible general narrowness of the aortic system. At autopsy, the heart was enormously distended and at the base measured 15 cm. All the cavities of the heart were enormously dilated. The left ventricle was the size of a goose egg. The valves were soft. In the left ventricle, the endocardium was slightly thickened, whitish and cloudy. The walls of the left ventricle were from 1.75 cm. to 2.00 cm. in thickness, and the right, 0.5 cm. The aorta was 5 cm. in circumference at the beginning portion and 3.5 cm. in the abdominal region. The intima as well as the entire wall was normal.

The second case of Apelt's was that of a seventeen year old boy, medium sized, slender and pale, with a well developed musculature. He was frequently subjected to considerable physical exertion. He had never had palpitation of the heart. His illness began with a cough. About six weeks later, he suddenly became very weak and short of breath. The cough increased. There was no palpitation at this time. He was cyanotic and edematous over the dependent portions. There was a large area of palpable pulsation in the cardiac region. The cardiac sounds were clear. The second aortic and pulmonic sounds were loud. The pulse was rapid, irregular, unequal and compressible. The liver was palpable and tender. The urine showed albumin. There were cough, nausea and vomiting. The temperature rose to 100 each evening. The eye grounds were normal. The edema was increasing. Blood culture was sterile. A soft, systolic murmur developed at the apex which later disappeared. Jaundice now appeared. The sputum was bloody. On account of the youth of the patient, his occupation, his build, the peculiar clinical findings and course of the illness, Lenhartz made a diagnosis of general narrowness of the aorta. At autopsy, the heart was 13 cm. in width at the base and weighed 495 grams. Both ventricles were markedly dilated, particularly the left. The auricles were also dilated. The thickness of the left ventricle was 1.6 cm., and that of the right, 0.5 cm. The valves were flat. The aorta was 1.9 cm. in diameter or 5.9 cm. in circumference at the beginning portion. The wall of the aorta was soft and thin, being 0.75 mm. in thickness at the beginning portion.

The clinical course and mode of death in this group of aortic hypoplasia are invariably cardiac. In the sixty-seven cases in the heterogeneous group of aortic hypoplasia ending in cardiac death which came to autopsy, von Ritook[1] found thirty-one with hypertrophy of the left ventricle, in twelve of which there was no dilatation, and twenty-seven with hypertrophy of the right ventricle, in twelve of which there was no dilatation. Seven cases showed dilatation of the left ventricle without hypertrophy, and eleven, dilatation of the right ventricle without hypertrophy. Eleven showed a normal left ventricle, and thirteen a normal right ventricle. Ten cases showed hypoplasia of the heart, as well. In nine it involved both sides, while in one case, the left was hypoplastic and the right, hypertrophic. A hypoplastic heart is considered by von Ritook to be incapable of hypertrophy for lack of "normal reserve power" of the myocardium. That such a heart may fail is illustrated by a case reported by Spitzer[22] where "the heart was in size similar to that of a child" in "a large, well developed, very muscular man with a pronounced panniculus adiposus."

The following diagnostic criteria have been gathered from various authors.

The condition is found among young people, usually between fifteen and thirty years of age, more often among well developed, healthy, and robust young males but also, perhaps less frequently, in pale, slender and clear skinned individuals, and particularly in those athletically inclined or engaged in strenuous physical labor. It affects males more frequently than females. Congenital anomalies are rarely encountered. If present, they are of a positive aid in diagnosis. As a rule, individuals in this group are said to show diminished resistance to infectious diseases. Presenting symptoms are those of cardiac decompensation of unexplainable causation and of

a comparatively short duration. No previous attacks are usually recorded, although in a small number of cases a history of slight cardiac discomfort may be elicited in their childhood. Onset is usually sudden and unexpected, coming on while at work or following an acute infection or strain which may be comparatively slight. Irritating cough may usher in the symptoms. Dyspnea and palpitation develop sooner or later and increase in severity with the progress of the disease. Cyanosis is usually present, particularly toward the end. Feeling of constriction and pressure in the chest may be complained of. These may constitute the only clinical manifestations in cases where death occurs suddenly without a history of onset or it follows a few days after the onset. The majority of them, however, rapidly progress into a state of cardiac decompensation with a rapidly developing passive congestion of the liver, which accounts for the loss of appetite, nausea, abdominal pain and diarrhea which may constitute prominent symptoms, early to develop and to remain throughout the course of the illness. Edema invariably develops. Spitzer[22] considers the edema in hypoplasia of the aorta to be of the hypostatic type, differentiating it from that of renal origin or that usual in cardiac failure. The temperature is likely to be subnormal. A high degree of fever is not attained, even in the presence of infection. The extremities are usually cold. Noteworthy is the highly anxious expression and striking pallor of the patient. The latter is explained partly by the hypoplasia of the minute peripheral vessels. The patient is usually alert and apprehensive. The heart is invariably enlarged, first to the left and soon to the right. At first, only the hypertrophy of the left ventricle supervenes. Compensation of the heart may be maintained indefinitely through the hypertrophy of the left ventricle. With increasing compensatory efforts, hypertrophy of the right ventricle usually follows. Dilatation of the chambers may gradually take place or may suddenly develop, depending upon the severity of the insult and the duration of the illness. The apex beat is displaced to the left, circumscribed or heaving diffusely and indistinct. The cardiac tones are usually described as pure and unmuffled. Murmurs may develop later. They may disappear after a period of rest. The pulmonary second sound is always accentuated. The jugular pulsation is usually absent. The radial arteries are small and the walls are delicate but the tension of the pulse is high. The retinal arteries may also be used as an index of the size of the artery. Hypertension is not the rule. Signs of mitral insufficiency and increasing embarrassment to the pulmonary circulation become more and more evident. Sputum becomes hemorrhagic toward the end, due to passive congestion or infarction. Jaundice may also develop. Clinically, the duration of the disease is from a few days to a year. Death is invariable.

At autopsy, the primary seat of the anomaly is to be found in the aorta, extending from the base of the heart to the various arterial trunks. The circumference of the aorta at its origin and at various points is, as already mentioned, definitely decreased. The intimal surface is, as a rule, smooth or may be streaked with a few yellow, atheromatous plaques. The thickness of the wall is said to be decreased. Smaller arteries are also said to be proportionately involved, although no convincing physiological or anatomical evidence has been put forward to support such a view. It would seem that with decreased intra-arterial pressure, occasioned by the narrowing of the aorta, the peripheral vessels are likely to be less distended and, therefore, are apparently more delicate. The heart is always involved. Hypertrophy of the ventricles with or without dilatation is the cardinal feature of the disease. The heart may resemble that in primary hypertension. An enormous, left ventricular hypertrophy may constitute the most prominent finding; this is more likely to be found in subjects with a short clinical course. Or a marked dilatation of the chambers, both right and left, with only a relative hypertrophy of the walls may be the most striking picture. Such a heart is found usually in those with a more prolonged clinical course. Rarely, the heart may be found hypoplastic with or without dilatation. Microscopically, there is no demonstrable evidence of degeneration, fibrosis or inflammation in the myocardium. The mural endocardium shows no lesion which may account for the cardiac hypertrophy and dilatation. The arterial walls show no degenerative or inflammatory changes. Variation in relative thickness of the three coats has been observed but this probably is of no significance.

Changes in the visceral organs, notably, the lungs and the liver, consequential to the circulatory failure, are evident, as is edema in the soft tissue and the body cavities. Duration of the disease usually governs the extent of these changes which are not unlike those found in any cardiac failure.

DISCUSSION

The impression prevails that hypoplastic aorta is not at all an uncommon finding in routine autopsy practice and, therefore, isolated instances of fatal cardiac failure in individuals showing no other lesion than a cardiac enlargement and a hypoplasia of the aorta cannot be explained on the latter finding alone. It is contended that if a decreased calibre of the lumen of the aorta alone should cause a cardiac hypertrophy and subsequent failure, far more cases than hitherto reported should be found at autopsy and find their way into the current literature.

However, with our present knowledge of the pathological physiology governing the mechanism of cardiac hypertrophy and failure where no tangible lesion is demonstrated, it would seem reasonable to assume that the narrowness of the aorta, which must necessarily offer a continued resistance to the forward flow of the blood, may be considered a factor contributing, more or less, to the hypertrophy and subsequent failure of the heart. The fact that the majority of hypoplastic aortas (which usually accompany a hypoplastic heart) seemingly cause no cardiac embarrassment, may be explained by the assumption that in those individuals there is probably a sustained circulatory balance and compensation which obviates over-loading of the heart and that undue circulatory demand by reason of excessive physical exertion or development is probably lacking. It is apparent that in these cases the aorta, itself, contributes little, if any, toward the compensatory efforts of the heart. No conclusive histologic evidence has been put forward to show that there are intrinsic changes in the wall of the aorta to such an extent as to influence the established circulatory balance. Changes observed in the wall of the aorta are doubtless secondary to the cardiac failure.

The fact that the occurrence of this condition is confined almost solely to the adolescent and post-adolescent periods is of great significance. It is assumed that in the physical growth of man, during these formative years, there is constant adjustment in the physiological processes of the body. It is further assumed that in some individuals, for some unknown cause or causes, the physiologic demand on the cardio-vascular system becomes too great or too sudden for the necessary adjustment, either on the part of the aorta alone or on the part of the heart as well as the aorta, which probably results in cardiac decompensation and, often, in sudden death.

REPORT OF CASES

Case 1.—F. E. J., a white male, twenty-eight years of age, fell dead while on his way to work on the morning of April 23, 1930. Bystanders had seen him running slowly just before he fell down on the sidewalk. He was found markedly cyanotic when picked up and died soon afterward. On April 17, or six days prior to death, the man suffered a sharp precordial pain while attempting to crank a street flushing machine. The pain continued for several hours. It was described as sharp and cramp-like in character and present over the precordium and in the left upper quadrant. He was dyspneic but was not cyanotic during this period. The following morning, he apparently felt no ill-effect from the attack of the previous day. Nothing unusual was noted by the members of the family. Following a three days' holiday rest, he returned to work on April 21 and worked for two days, apparently as usual, as a street flusher. Past history was unimportant except that he had an attack of influenza in 1918, when he was told that he had a "leakage" of the heart. He appeared robust and muscular in build, athletically inclined and had always indulged in strenuous sports without apparent ill-effect. In February of this year, he had a physical examination for a government position and was pronounced physically fit. His blood pressure at the time was normal.

Necropsy Findings.—The body was embalmed on the day of death, April 23, 1930, and buried. It was exhumed on May 19, 1930, or twenty-six days later, for examination. The body was well developed and well nourished, 180 cm. in length and approximately 175 pounds in weight. The muscles were well developed. No jaundice was noted. The pupils were equal and 5 mm. in diameter. There were patches of mould growths and areas of mahogany and greenish discoloration over various parts of the body. The fingers were dry and shrunken. There were no marks indicative of external violence. The external genitalia were normal.

The peritoneal cavity contained no excess fluid. The appendix was 11.5 cm. in length and 7 mm. in average diameter, retrocecally located and firmly adherent to the posterior peritoneum and ran perpendicularly upward toward the gallbladder.

The pleural and pericardial cavities contained no excess amount of fluid and showed no adhesions.

The heart weighed 525 grams (Figs. 1 and 2). The epicardium was smooth and showed no excess fat. The wall of the left ventricle showed a marked concentric hypertrophy, was dark red in color and solid in consistence. It was 22 mm. in thickness. The chamber was moderately dilated. The right auricle was greatly dilated. The left ventricle was 7 cm. in depth and the right, 6.5 cm. The valves were essentially normal. The free edges of the aortic leaflets appeared slightly indurated. The tricuspid orifice was 12.3 cm. in circumference; the pulmonary, 8.2 cm.; the mitral, 9.5 cm.; and the aortic, 5.5 cm. The coronary vessels were normal. The root of the aorta showed a smooth intimal surface. The aorta was definitely small. It showed a circumference of 5.5 cm. above the aortic valve, 4.0 cm. at the arch. There was a distinct shortening and narrowing (Fig. 3) at the arch (1.2 cm. in diameter). The thoracic portion was 4.5 cm. in circumference.

The left lung was 420 grams in weight and the right, 825 grams. The lower lobes and the dependent parts were diffusely dark red and filled with blood and fluid.

The spleen weighed 170 grams. The pulp was dark red and solid.

The liver was 1,950 grams in weight. The lower border extended down 4 cm. below the xiphoid process. The markings were indistinct, due probably to autolysis, except along the peripheries where the centers of the lobules could be well identified.

The gastro-intestinal tract, the pancreas and the adrenals were grossly normal.

The right kidney was 125 grams in weight and the left, 130 grams. The capsules stripped readily, leaving slightly lobulated surfaces. The cut surface was deep red and showed normal markings.

The genital organs were normal.

The mediastinal lymph nodes were somewhat swollen and prominent.

The thymus was practically absent.

There were no congenital anomalies or deformitis.

Diagnoses.—1. Hypoplasia of the aorta. 2. Cardiac hypertrophy (the left and right ventricles). 3. Edema and congestion of the lungs. 4. Passive congestion of the liver, spleen and kidneys.

Fig. 1. Case 1. Heart, 525 grams. Marked hypertrophy of the left ventricle. Circumference above the aortic valve, 5.5 cm.

Fig. 2. Case 1. Heart arch and thoracic aorta, reconstructed, posterior view. Note an extremely small arch.

Fig. 3. Case 1. Arch of aorta, sectioned at the turn, showing a narrow lumen.

Microscopic Examination.—The heart showed no evidence of disease. There was no fatty infiltration, amyloid degeneration, fibrosis or inflammation of the myocardium. The aorta showed no degeneration or inflammatory changes in its walls. The kidney showed no evidence of arteriolar disease. The lungs, liver and spleen showed acute passive congestion to a marked degree.

Comment.—It is interesting to note that the patient had a "leakage" of the heart in 1918. Doubtless his heart was, then, temporarily decompensated following the attack of influenza. He evidently was able to make a complete recovery from this illness. His heart had since undergone continued compensatory hypertrophy without failure, under almost constant strenuous physical exertion. Sudden overstrain resulting from heavy cranking, however, brought on the acute decompensation of the heart from which recovery was impossible. Death occurred within a week.

*Case 2**.—M. S., female, white, single, twenty-three years of age, whose present illness dated back to May 2, 1930, or two and a half months before death, when patient suffered from "stomach flu" or gastro-intestinal upset, vomiting and dyspnea, with no fever. Patient had caught cold, felt sick headache, queer pains in ab-

*From the Medical Service of Dr. Edgar T. Herrmann.

domen with nausea and vomiting. Then, her heart began to beat rapidly, breathing became short and she felt tired easily. On her first admission to the hospital on May 12, her heart showed soft gallop rhythm but no murmurus, and the lungs, some moist râles in the bases. Blood pressure was 86 systolic and 70 diastolic. two and a half months after the onset of illness. Urinalyses were repeatedly negative. Feces showed nothing of interest. Blood remained about the same with tendency to relative lymphocytosis and showing toxic changes in the neutrophils. The Van den Bergh test showed a two plus direct immediate reaction and also

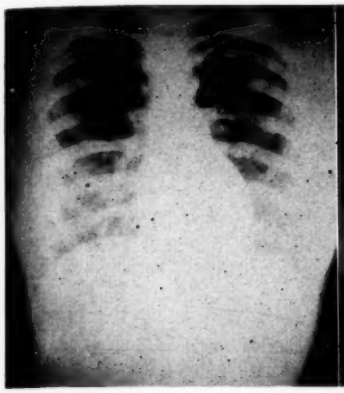

Fig. 4. Case 2. Heart at six foot distance taken August 2, 1929. Transverse diameter 11.5 cm. (43.7 per cent of T. D.)

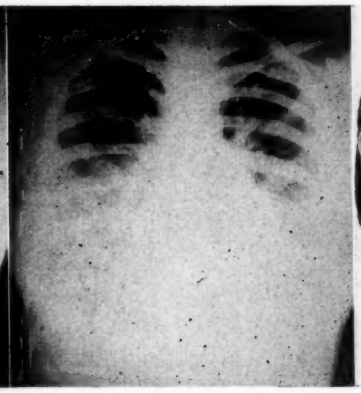

Fig. 5. Case 2. Heart at six foot distance taken May 12, 1930. Transverse diameter 15.2 cm. (55.6 per cent of T. D.)

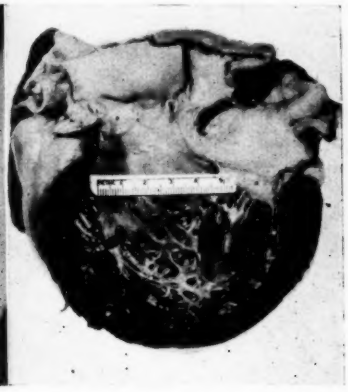

Fig. 6. Case 2. Heart, 400 grams. Hypertrophy and dilatation of the left ventricle. Circumference above the aortic valve, 5.0 cm.

Abdomen and extremities were negative. Repeated urinalyses were negative. Hemoglobin ranged between 75 and 80 per cent; erythrocytes between 4,000,000 and 4,500,000; leukocytes, between 9,000 and 15,000, with lymphocytes up to 52 per cent. Throat culture was negative for diphtheria. The basal metabolic rate was plus two per cent. Electro-cardiograms showed a weakened myocardium and, at one time, delayed auriculo-ventricular conduction. Temperature was subnormal most of the time. Pulse ranged between 100 and 125 and respiration from 18 to 22 per minute. Patient was discharged on June 12 as improved, with a diagnosis of toxic myocardium. Patient was readmitted on July 8, 1930, with aggravation of the above symptoms, particularly referable to the gastro-intestinal tract. She was nauseated, belched much gas and vomited several times a day. The vomitus consisted mostly of bile. Food could not be kept down. There was generalized abdominal pain. Slight relief was obtained from belladonna. The bowels had been loose, two or three movements a day. No blood was noted in the stools. Cyanosis and dyspnea became more and more marked. Two days before death, there were signs of fluid in the right pleural cavity. The roentgenograms showed a diffuse cloudiness of the right lower field which was interpreted to be either pleural effusion or pulmonary infarct. Thoracentesis was done and about 40 c.c. of bloody fluid was obtained. Patient coughed up some bloody sputum. The heart showed no murmurs at any time. There were no palpable thrills. The outline of the heart showed a gradual enlargement since the onset of illness both roentgenologically and on percussion. Death occurred on July 18, 1930, or a two plus indirect reaction, with 2.5 mgms. of bilirubin per 100 c.c. of blood. Blood chlorides were 460 mgms. Blood culture was negative.

Past history was of no significance except that the patient was always somewhat anemic with hemoglobin ranging between 70 and 80 per cent, 4,000,000 erythrocytes and a normal leukocyte count. The differential count always showed a tendency to relative lymphocytosis. She had had an appendectomy in 1925. Her roentgen diagnosis at the time had been moderate visceroptosis. Roentgenograms of her heart (Fig. 4) made on August 2, 1929, showed a transverse diameter of 11.5 cm., which was 43.7 per cent of the thoracic diameter. On May 12, 1930, ten days after the onset of the present illness, the transverse diameter of the heart was 15.2 cm., which was 56.6 per cent of the thoracic diameter. The heart, at this time, showed a globular enlargement both to the right (m.r. 5.6 cm.) and to the left (m.l. 9.6 cm.) with a small, short and narrow arch, 4.9 cm. in diameter (Fig. 5). Subsequent roentgenograms of the chest showed a progressive enlargement of the heart in all directions, such as might be expected in a failure.

Necropsy findings.—The body was that of a well developed, well nourished, adult white female, 166 cm. in length and about 140 pounds in weight. There was no rigor. There was a slight degree of hypostasis in the dependent parts. There was no appreciable amount of edema. No jaundice was detected although the skin was waxy and pale. The finger tips were slightly cyanotic. The pupils were equal and 6 mm. in diameter. There was a 12 cm. right rectus scar. The breasts

were well developed. The external genitalia were normal.

The subcutaneous adipose tissue was well preserved.

The peritoneal cavity contained approximately 200 c.c. of clear, amber fluid. The appendix was absent. The liver extended 4 cm. from the xiphoid process and 3 cm. from the costal margin on the right side. The diaphragm was at the fourth rib on the right and fifth rib on the left.

The right pleural cavity contained approximately 300 c.c. of dirty, bloody, amber fluid. The left pleural cavity contained no fluid or adhesions.

The pericardial cavity contained about 125 c.c. of clear, straw-colored fluid. No adhesions.

The heart, in situ, with pericardium intact, was 15 cm. in transverse diameter. It weighed 400 grams (Fig. 6). It was greatly distended with blood. The epicardium was stretched and smooth. The myocardium was dark, beefy red and somewhat soft in consistence. The left ventricle was 1.3 cm. in thickness. The right ventricle was 4 mm. in thickness. The chambers were markedly dilated. The left ventricle was 9 cm. in depth and the right, 9.5 cm. The valves showed no disease. The tricuspid ring was 14 cm. in circumference; the mitral, 11 cm.; the pulmonary, 7 cm.; and the aortic, 5 cm. A small, well organized thrombus was noted in the right auricular appendix and along the apex of the left ventricle. The mural endocardium was smooth except for an area of grayish, fibrous thickening along the left ventricle. The coronary arteries showed no disease and at their orifices they were not more than 2.5 mm. in diameter. The root of the aorta showed a smooth, elastic wall. The intimal surface was shiny. The arch was reduced in diameter, as were the great vessels arising from it.

The aorta and its main branches were decreased in size throughout. The ascending aorta just above the valve was 5.0 cm. in circumference. The thoracic portion below the left subclavian artery was 3.5 cm., and the abdominal portion near the bifurcation, 2.2 cm. The wall was elastic and not more than 2 mm. in thickness at the arch. The common iliac arteries were not more than 4 mm. in diameter. The intimal surface was smooth.

The left lung weighed 230 grams. Crepitation was slightly reduced throughout. The pleural surfaces were wrinkled. The cut surfaces were meaty and slightly congested. The right lung weighed 400 grams. Crepitation was preserved throughout the upper lobe. The lower lobe showed a large area of consolidation along the axillary periphery, over which the pleura was stretched and bluish in color. The cut surface showed a solid area of dark red discoloration. The lower trunk of the pulmonary artery and its branches leading into this area were filled with solid coagulum.

The spleen weighed 150 grams. The capsule was smooth and tense. The pulp was grayish red and solid. The corpuscles and trabeculi were indistinct.

The liver weighed 1,350 grams. The capsule was slightly grayish and fibrous. The cut surface showed extensive hemorrhage about each of the lobular centers. The yellowish intervening parenchyma was swollen and cloudy. The gallbladder was distended with dark, viscid bile. The wall was thickened and fibrous. The serosa was fibrous and the mucosa showed prominent folds. No calculi were found in the bladder or the ducts.

The stomach and the intestines were grossly normal. The pancreas and the adrenal glands were likewise normal.

The right kidney weighed 120 grams; the left, 125 grams. The capsules stripped readily leaving smooth, dark red surfaces. The cut surfaces were dark red and showed normal markings. The ureters and the urinary bladder were normal.

The uterus and the adnexæ were normal in development and appearance. The uterine cavity contained a small amount of blood clot.

There was no appreciable enlargement of the lymph nodes. The thymus was not recognized.

The thyroid gland was slightly enlarged and filled with colloid.

The marrow of the right femur was fatty.

Blood culture was negative.

Diagnoses.—1. Hypoplasia of the aorta. 2. Cardiac hypertrophy and dilatation. 3. Thrombosis of the right auricle and left ventricle. 4. Embolism of the right pulmonary artery. 5. Infarction of the right lung. 6. Chronic passive congestion of the liver, spleen and kidneys. 7. Chronic cholecystitis. 8. Colloid goiter. 9. Right pleural effusion. 10. Pericardial effusion. 11. Ascites.

Microscopic Examination.—The myocardium was normal. No amyloid degeneration and fatty infiltration or degeneration were noted by special stains. There were no areas of fibrosis or recent inflammation. The muscle fibers appeared swollen and edematous. The mural thrombus along the left ventricle showed organization but no exudative inflammation. This was taken to be a terminal process. A slight fibrous thickening of the mural endocardium was present with an area, in one section, of subendocardial infiltration of monocytes and lymphocytes. The aorta showed a normal intima and media but rather prominent and engorged vaso-vasorum in the adventitia. No fatty infiltration was found in the intima.

Few of the arterioles of the lungs showed medial and intimal thickening or edema. An organized embolus of the pulmonary artery with consequent hemorrhagic infarction of the involved area was found. The vessel walls showed no amyloid changes. Areas of edema, patchy atelectasis and emphysema were present.

In the liver there was marked central necrosis and hemorrhage and atrophy of the cords with fatty infiltration in the necrotic area about the lobular center. The gallbladder showed chronic nonsuppurative cholecystitis. The spleen and the kidneys showed passive congestion. The breasts were normal. The mediastinal lymph nodes were swollen and edematous and showed diffuse extravasation and lymphoid hyperplasia.

Comment.—The patient was young, well developed and well nourished, but always had ap-

peared "anemic." The fatal illness may be definitely traced back to the "influenzal" infection two months and a half before death. The heart showed no clinical or physical signs of a valvular disease or hypertension. It showed a rapidly developing, diffuse enlargement (dilatation), rapid pulse and no murmurs. Signs of broken compensation with dyspnea, cyanosis, lowered blood pressure, gastro-intestinal disturbance and later, edema and bloody sputum, all pointed to no definite diagnosis. The possibility of toxic myocardium of an unknown etiology, a congenital cardiac lesion or a tumor growth, was ventured, clinically.

*Case 3.**—W. R., a white male thirteen years of age, who was admitted to the hospital at 7:15 a. m. for a nasal operation and died under anesthesia at 10:10 a. m. of the same morning. The patient was prepared for operation, a 1:1000 adrenalin pack was put in the nose at 8:15 a. m. Alkoform anesthesia was started at about 8:55 a. m. About two ounces of the anesthetic, representing about 10 c.c. of chloroform, had been used during the subsequent thirty minutes when the patient became fully anesthetized. Pulse and respiration were normal. Not more than 1 c.c. of 1:1000 adrenalin was then injected into the nasal mucosa, preparatory to operation. The patient became suddenly cyanotic, respirations stertorous and pupils widely dilated. Breathing soon stopped excepting occasional gasps, and the pulse ceased. Death was pronounced at 10:10 a. m.

The patient was somewhat overweight and overgrown for his age. He was fatty and flabby but athletically inclined. The day before admission, he underwent physical examination and was pronounced satisfactory to submit to general anesthesia. Blood pressure was normal, being about 112, systolic. Urinalysis showed one plus albumin but was otherwise negative. Hemoglobin was 76 per cent and leukocytes 6,650.

The patient had been in this hospital from June 10, 1930, to July 10, 1930, with chronic suppurative otitis media, right and left, and acute suppurative mastoiditis, left, for which simple mastoidectomy had been performed. He returned on September 2, 1930, and had a radical mastoidectomy done on his left mastoid under general anesthesia. He had been troubled with a deviated nasal septum and resulting nasal accessory sinusitis and continued infection of his ears.

Necropsy Findings.—The body was that of a well developed, well nourished, somewhat obese, young, white male, 178 cm. in length and approximately 160 pounds in weight. Rigor was absent. Slight degree of hypostasis was present in the dependent portions of the body. There was a diffuse cyanosis of the face but no edema or jaundice. The pupils were equal and 5 mm. in diameter. There was no external evidence of violence. There was a healed mastoidectomy scar in back of the left ear. The subcutaneous adipose tissue was abundant and about 1.5 cm. in thickness.

The peritoneal cavity contained no excess fluid. The appendix was retrocecal and adherent and 12 cm. in length and approximately 8 mm. in diameter. It showed no evidence of recent inflammation. The diaphragm was at the third rib on the right and the fourth rib on the left.

Fig. 7. Case 3. Heart, 300 grams. Hypertrophy and slight dilatation of the left ventricle with a narrow aortic orifice, 4.6 cm. in circumference above the valve.

The pleural cavities showed no adhesions and no fluid.

The pericardial cavity contained approximately 25 c.c. of reddish, amber fluid.

The heart was distended and weighed 300 grams (Fig. 7). There were small subpericardial hemorrhages. The myocardium was pale red and slightly softer than normal. The wall of the left ventricle appeared somewhat thickened. It was 18 mm. in thickness. The right ventricle was slightly dilated and the wall was approximately 8 mm. in thickness. The mural endocardium was smooth. The valves showed no disease. The root of the aorta showed a smooth intimal surface. The ascending portion of the aorta was approximately 1.5 cm. in diameter and 4.6 cm. in circumference just above the aortic leaflets.

The right lung weighed 225 grams; the left lung, 195 grams. Crepitation was preserved throughout. The cut surfaces were pinkish-gray in color and apparently entirely normal.

The spleen weighed 220 grams. The capsule was smooth. The pulp was dark red and somewhat soft and swollen. Malpighian corpuscles were numerous and prominent, some measuring about 1 mm. in diameter.

The liver weighed 1,600 grams. The capsule was smooth. The cut surface was pale brown in color and soft and cloudy. The markings were indistinct. The gallbladder was normal.

The stomach and the intestines were normal. The pancreas was normal.

*From the Otological Service of Dr. C. E. Connor.

The right adrenal showed hemorrhages in its substance. It was otherwise normal. The left adrenal was normal. The right kidney weighed 130 grams; the left kidney, 130 grams. The capsules stripped readily, leaving smooth, dark red surfaces. The cut surface was dark red and the markings were normal.

The urinary bladder was normal. The genital organs were normal.

The aorta was smaller than normal. The circumference above the bifurcation was 2.5 cm. There were numerous enlarged lymph nodes, particularly in the mesenteric chains, where they attained a size 2 × 1 cm. They were soft, meaty and evidently hyperplastic. Numerous lymph nodes were scattered throughout the mesentery and mediastinum and pulmonary hilum.

The thymus weighed 35 grams. A portion of it was found supersternally.

There was an area of ecchymosis over the skull over the left frontal area, about 2 cm. in diameter, without any discoloration of the scalp over it.

The brain was grossly normal, except for a slight congestion. The right mastoid consisted of somewhat sclerotic cells. No exudate was found. The left consisted of a large cavity communicating with the external meatus and a petrous portion still showing a few irregular cells bathed in greenish, purulent exudate.

Diagnoses.—1. Hypoplasia of the aorta. 2. Cardiac hypertrophy and dilatation. 3. Passive congestion of the spleen, kidneys and brain. 4. Fatty liver. 5. Chronic suppurative mastoiditis, left side.

Microscopic Examination.—The liver showed a marked atrophy of the liver cords with central hemorrhage, indicating a high degree of chronic passive congestion which strongly pointed to a cardiac decompensation of some duration. It also showed a moderate degree of fatty infiltration. The spleen and kidneys showed diffuse congestion; no arteriolar disease. The cardiac muscles showed no evidence of fatty change, fibrosis or any other degenerative process. The wall of the aorta was essentially normal. The lungs showed a slight degree of congestion. The lymph nodes showed a diffuse hyperplasia.

Comment.—Diagnosis in this case was based upon the finding of a relatively small caliber of the aorta for the size of the heart, which was distinctly enlarged for the age of the patient. This was further strengthened by the robust, athletic build of the individual. That the death was due to cardiac failure was substantiated by the microscopic appearance of the liver, which presented a high degree of chronic passive congestion. There was no valid basis to support the theory that the death was due to adrenalin or chloroform. On the other hand, a certain school of pathologists might readily explain the cause of death on the basis of the so-called thymicolymphatic constitution.

*Case 4.**—E. N., a male eighteen years of age, after running up three flights of stairs to a class room, collapsed and died suddenly at 8:36 a. m., November 6, 1931. On September 24, 1931, the boy underwent a physical examination at the Student Health Service, the record of which was essentially as follows: He had measles at two, scarlet fever at fourteen years of age; complained of occasional earache and discharge and nose bleed. He was subject to dizziness. He was 67.5 inches in height and 108 pounds in weight. He had gained twenty pounds in the last two years. Blood pressure was 122 systolic and 80 diastolic. Pulse was 77 per minute. His pulse rose to 112 after exercise and came down to 96 in two minutes. He gave a history of irregularity of heart beat and dyspnea following moderate exercise. He was described as asthenic in type.

The father wrote, in response to the inquiry, that "there was nothing in the boy's physical make-up to point to heart trouble during his lifetime except 'short windedness.' It was more noticeable while he was exercising in an upright position. He never exercised until completely worn out. During the past two or two and a half years, he seemed to be overcoming his difficulty. His two years' physical training at Junior College was no special effort for him. He never missed a day of school because of illness."

Necropsy Findings (by Dr. J. B. Clawson).—The body was that of a well developed, well nourished, white man, 174 cm. long and weighing about 140 pounds. Rigor was absent; body temperature was still present; there was a slight purplish hypostasis posteriorly; no edema or jaundice; grade two cyanosis in the lips and fingers. Each pupil measured 5 mm. in diameter. There was a small, superficial abrasion on the left elbow.

The peritoneum was smooth, glistening, and the cavity was free from excess fluid. The appendix was anterior and free. The diaphragm was at the fifth rib on both sides.

The pleural cavities were free from fluid and adhesions. The pericardium was smooth, glistening, and the cavity contained about 20 c.c. of clear fluid.

The heart weighed 435 grams (Fig. 8). The myocardium was very firm; the color was red. The ventricles stopped in systole. The hypertrophy was confined mostly to the left ventricle. The wall of the left ventricle was 23 mm. in thickness; that of the right was 9 mm. No changes were noted in the valves except that the aortic cusps were small. The circumference of the aorta at the level of the cusps was 4.5 cm.; the circumference of the entire aorta was proportionally small. The root of the aorta and the coronary arteries were smooth.

The right lung weighed 280 grams; the left, 250 grams. Both crepitated throughout and were free of nodular or consolidated areas. On section, the lungs were found to be of pinkish-gray color and showed feathery consistence.

*From the Student Health Service of the University of Minnesota.

The spleen weighed 130 grams and appeared to be of normal consistence. On section, no gross changes were noted in the pulp.

The liver weighed 1,335 grams. It was dark red. There was a considerable amount of blood in the liver but the centers of the lobules were not darkened. No

Fig. 8. Case 4. Heart, 435 grams. Marked hypertrophy of the left ventricle and a narrow ascending arch with a circumference of 4.5 cm. above the valve.

abnormalities were seen in the gallbladder, gastrointestinal tract, pancreas, or adrenals.

The right kidney weighed 120 grams; the left, 130 grams. The capsules stripped easily and left smooth surfaces. On section, no evidence of atrophy was detected in the cortices and the cortical markings were well preserved. The mucosa of the bladder showed a small amount of trabeculation. There was no enlargement of the prostate and no changes were seen in the seminal vesicles.

The abdominal aorta was smooth. There was no enlargement of the lymph nodes.

The scalp, cranium, meninges, and brain appeared entirely normal.

Diagnoses.—1. Hypoplasia of the aorta. 2. Cardiac hypertrophy.

Microscopic Examination.—The myocardium of the left ventricle showed a definite hypertrophy of the individual muscle fibers. The liver showed diffuse, cloudy swelling and edema—no passive congestion. Moderate congestion of the spleen, kidneys and adrenals. No sclerosis of the renal arterioles.

Comment.—There is a striking similarity between this case and Case 1. Doubtless the patient showed a well sustained circulatory compensation during his adolescence through an increasing hypertrophy of the heart. The sudden insult in the form of "climbing up a few flights of stairs" was sufficient to break this compensation. There was no microscopic evidence of cardiac failure which preceded the fatal termination.

SUMMARY AND CONCLUSION

Four cases of hypoplasia of the aorta terminating in death are reported. In each instance, autopsy disclosed a cardiac hypertrophy with relative dilatation, without any other demonstrable lesions except a small aorta.

Case 1, a robust young man of twenty-eight who showed a prolonged period (at least twelve years) of perfect compensation with a marked left ventricular hypertrophy, developed an acute fulminating decompensation following a severe physical strain and died within a week.

Case 2, a well developed young woman of twenty-three, who had always been pale, ran a subacute or chronic course of cardiac decompensation following an attack of "influenzal" infection and died in eleven weeks. She showed a rapidly increasing cardiac enlargement with progressive decompensation without signs of known organic heart lesions or hypertension.

Case 3 was that of an overgrown boy of thirteen who died during sudden insult occasioned by anesthesia. Physical examination, a day before, had been entirely negative. Post-mortem evidence indicated a pre-existing cardiac decompensation of unknown duration.

Case 4 was that of a young man of eighteen years who died suddenly after climbing a flight of stairs. The only information of pertinence was that he gave a history of irregularity of heart beat and dyspnea following moderate exercise and of being subject to dizziness.

In none of the four cases were congenital anomalies involving the genital apparatus, heart or any other visceral organs found.

The literature is briefly reviewed and diagnostic criteria are formulated from several of the authors.

Hypoplastic aortas which cause no cardiac symptoms have been encountered from time to time, in our routine autopsy practice, only to be overlooked or disregarded by the examiner. No plausible explanation has been advanced for the evident dilemma that whereas a group of cases showing a hypoplastic aorta manifest definite cardiac symptoms or die of sudden heart failure, many others evidently show no signs of cardiac involvement.

In the light of our present knowledge, it would seem reasonable to state that there is a sufficient basis for assuming, until otherwise proven, that hypoplasia of the aorta may be a major factor

in the causation of cardiac hypertrophy and subsequent sudden failure and death in young, robust individuals who show no other demonstrable lesions at autopsy.

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ACUTE VASOSPASTIC HYPERTENSIVE DISEASE WITH TRANSITION INTO MALIGNANT HYPERTENSION: FINAL REPORT OF A CASE WITH NECROPSY*

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THIS case was previously reported at both the 1930 and 1931 meetings of the Southern Minnesota Medical Association. Since then, the patient has died, and necropsy was performed by one of us (Beaver), the report of which constitutes the basis for this paper. A brief review of the history and previous clinical observations are given, for they are apparently confirmed by the postmortem studies.

This patient had had a severe, acute infection of the throat about January 1, 1930. At that time he was twenty-nine years of age. About two months later he came under our care, complaining of attacks of extremely severe abdominal cramps, very severe headaches, and typical attacks of angina pectoris, all of which had been transiently relieved by nitroglycerine, which the patient had begun to take shortly after the onset of the symptoms. At the time of his first examination by us his blood pressure in millimeters of mercury was 180 systolic and 140 diastolic. There was no evidence of nephritis. The urine was normal. The intake and output of fluid balanced well. Blood urea determinations were normal, and phenolsulphonphthalein was excreted in good concentration. The eye-grounds were clear of exudates and hemorrhages. The retinal vessels, however, were slightly narrowed, but definite sclerosis was not noted. Diagnosis was made of acute vasospastic hypertensive disease. A great deal of improvement of symptoms followed. About a year after the onset of the disease the patient had gained about 40 pounds

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(about 18 kg.) and felt fairly well. He had practically no pain, and was able to walk four or five miles slowly without special fatigue. The blood pressure at this time was, however, 200 mm. of mercury systolic and 150 diastolic, and the urine contained some albumin, with a few hyaline and leukocytic casts. The vessels of the retina were irregular and notched, but still there were no signs of exudate, hemorrhage or edema of the disks.

About four months later, however, examination revealed retinal changes typical of malignant hypertension. At this time, definite enlargement of the heart and high grade arteriosclerosis were easily demonstrated in the peripheral and retinal vessels. In a microscopic study early in the disease of a piece of pectoral muscle, the arterioles were wide open but there was a little early proliferation in the walls. A second biopsy, made about twenty months after the onset, revealed marked proliferative changes, with complete closure of some of the arterioles. At this time also there was for the first time demonstrable evidence of renal insufficiency. Progression of the arteriolar disease and hypertension continued until the patient died of combined cardiorenal and vascular insufficiency, about two years after the onset of his illness. Table 1 (previously published) gives an outline of the clinical data.

TABLE I. ACUTE VASOSPASTIC HYPERTENSIVE DISEASE (TRANSITION INTO TYPICAL MALIGNANT HYPERTENSION)

Date	Urine				Blood			Blood pressure, mm. mercury		Heart			Arteriosclerosis		Retinitis	Muscle biopsy (arteriolar study)
	Albumin, grade	Blood, grade	Casts, grade	Phenolsulphonphthalein, per cent, 2 hours	Anemia	Urea, mg. per cent	Serum sulphates, mg. per cent	Systolic	Diastolic	Hypertrophy, grade	Significant electrocardiographic changes	Gallop rhythm	Radial, grade	Retinal, grade		
2-21-30	0	0	0	Normal	0	Normal		180	140	0	Yes	Yes	0	0 some slight constriction	0	Normal wall to lumen ratio; some proliferation of both intimal and medial nuclei
4-26-30	0	0	0					170	120				0	0		
Apr. 1931	Some	0	Some	45 per cent	0	Normal		200	150	1 to 2	Yes	Yes	1 to 2	1 to 2	0	Wall to lumen ratio 1:1; marked increase in intimal and medial nuclei; some arterioles completely closed, proliferation
7-29-31	2 to 3	0	0 to 1		0	20	6.03	225	160				3	2 to 3	Typical malignant hypertension	
12-19-31	Patient died; necropsy performed															

NECROPSY

Necropsy was performed twenty-four hours after death. Cavity and vascular embalming had been done.

Macroscopic features.—Extreme emaciation was present, although the lower extremities were markedly edematous. The fluid content of the peritoneal cavity could not be estimated because of the cavity embalming. The left pleural cavity gave off a gush of air as it was opened. It contained a large quantity of purulent exudate with a putrid odor, and except for its sites of adhesions, the pleura was covered by thick fibrinopurulent, partially adherent exudate. Throughout the upper lobe of the left lung were multiple, large and small, sharply circumscribed, hemorrhagic and grayish regions of consolidation. One of these areas presented frank suppuration, with necrosis of the surrounding pulmonic tissue. This had perforated into the left pleural cavity, giving rise to pyopneumothorax. The portions of the left lung, not involved by these changes,

were collapsed. Multiple thrombi were present in the pulmonary arteries, especially those which led to the regions of consolidation. The right visceral and parietal pleural surfaces were partially covered by fibrinopurulent exudate. The lower portions of the upper and lower lobes of the right lung were consolidated. These regions of consolidation were sharply circumscribed and hemorrhagic. Thrombi were present in most of the branches of the right pulmonary artery. The transverse pericardial measurement was 15 cm. The visceral pericardium was sparsely covered by fibrinous exudate, which gave it a shaggy appearance. The heart weighed 525 gm. The chambers of the heart were dilated, and on the endocardium of the right auricle and right and left ventricles were firmly attached mural thrombi, some with central puriform softening. The valves were normal. The coronary arteries were sclerosed to a moderate degree.

The spleen weighed 250 gm. It revealed only moderately severe congestion and small regions of anemic infarction. The liver weighed 2,100 gm. Its capsular and sectioned surfaces revealed the nutmeg mottling of passive congestion. In the right lobe was an encapsulated hematoma measuring 7.5 by 4 cm. Many of the larger hepatic arteries contained thrombi. On the anterior surface of the left lobe there was a deep fissure with puckered borders, and a fibrous scar at the base. On the posterior wall of the duodenum, 1 cm. below the pylorus, there was an ulcer 0.8 cm. in diameter with a clean, dense, thickened base. The crater of the ulcer penetrated into the duodenal submucosa. The remainder of the gastro-intestinal tract appeared normal.

In the pancreas there were multiple, small grayish, necrotic foci. Both suprarenal glands were densely encapsulated by fibrous connective tissue. The medullary substance was relatively large in amount, with corresponding relative thinning of the cortex. A small amount of hemorrhagic extravasation was present in the medulla of both glands. The kidneys together weighed

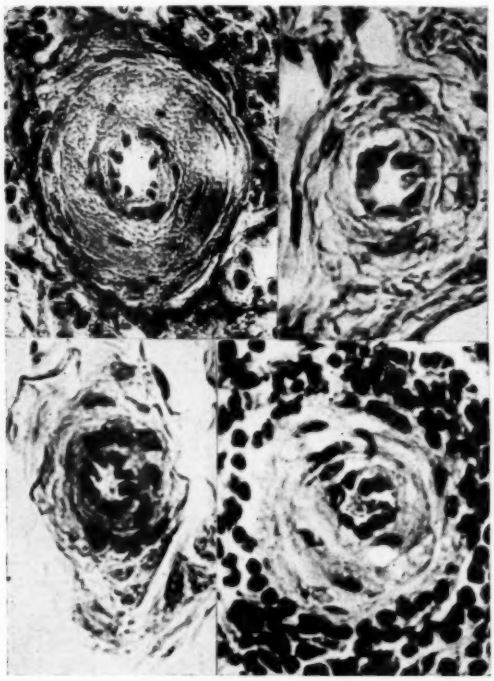

Fig. 1. Arterioles from four anatomic situations (upper left, kidney; upper right, liver; lower left, pectoral muscle; lower right, spleen). Reduction of the caliber of the lumen is evident in all.

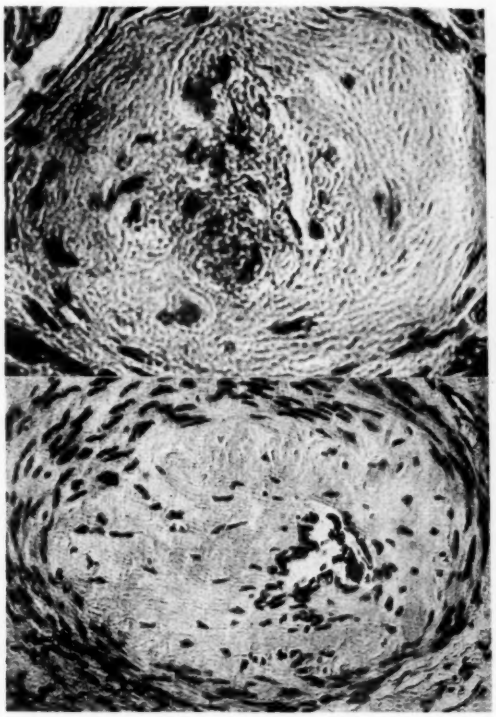

Fig. 2. Renal arteries. Hypertrophy and increased cellularity of the media. Intimal proliferation and narrowing of the lumen. Hyaline changes are seen in both intima and media.

200 gm. They were covered by dense fibrous tissue capsules which could not be stripped without tearing the renal substance. Throughout the fibrous tissue of the capsules a considerable quantity of dark brown pigment was revealed. The cortical surfaces of the kidneys were granular, and contained a number of relatively deep pits and scars. Cortical and medullary markings were obscure. The cortexes were, on an average, 0.6 cm. thick, and the medullas 1.2 to 1.5 cm. thick. A recently formed thrombus occluded the left renal artery. The pelves of the kidneys, the ureters, the bladder and the prostate gland revealed no pathologic changes.

Fig. 3. Increased cellularity, thickening of capillary basement membranes and hyaline foci are revealed in the glomeruli. Tubular atrophy with replacement by connective tissue is also shown.

Microscopic features.—Sections of the tissue were fixed in Orth's fluid, embedded in paraffin, and stained with hematoxylin and eosin. The van Gieson connective tissue stain and scharlach r were employed in selected instances.

The myocardium revealed hypertrophy of muscle fibers, within which there was a moderately severe grade of lipoid change. The mural thrombi of the heart were partially organized. Centrally, the clots contained semifluid débris. Sections of both right and left lungs revealed evidence of fibrinopurulent pleurisy, hemorrhagic infarction, and bronchopneumonia. Emboli were present in many pulmonary arteries. In some regions of the left lung suppuration had progressed to formation of abscesses. This was particularly true in the region of spontaneous perforation, in which pulmonary gangrene, on the basis of infarction with secondary suppuration, was evident. The liver presented the typical changes of chronic passive congestion. Sections from the hepatic hematoma revealed that it was surrounded by a thick, fibrous capsule, throughout which blood pigments were abundantly deposited. Connective tissue organization of the peripheral portion of the blood coagulum was fairly well advanced. Many small and medium-sized branches of the hepatic artery were occluded, some by organized thrombi, others by more recently formed to fresh thrombi. The base of the deep fissure which existed in the left lobe was composed of scar tissue. In this zone organized thrombi were usually found to occlude the branches of the hepatic artery. The spleen re-

Fig. 4. Relatively normal glomeruli and tubules alternating with regions such as are revealed by Figure 3.

vealed extreme sinusoidal engorgement, with relative atrophy of lymphoid tissue, and multiple, small areas of infarction. In sections of the pancreas were multiple foci of necrosis. About these were collected a small number of polymorphonuclear leukocytes. The renal capsules were markedly thickened. Throughout the capsules were deposits of blood pigments. Marked parenchymal atrophy existed in the subcapsular cortical zones. Throughout the remainder of the cortexes there were zones of relatively normal tubules and glomeruli, alternating with portions revealing varying degrees of glomerular injury and parenchymal atrophy. The changes in the arterioles and arteries of medium size were extreme; there were hypertrophy of the media and proliferation of the intima, resulting in loss of caliber of the lumens of the vessels. In some vessels the lumens were completely obliterated. Hyaline foci were common in the thickened media or intima. Lesser glomerular reactions consisted of increase of nuclei of the glomerular tufts, together with thickening of the capillary basement membrane. Progressive reactions resulted in focal hyaline changes within the glomerular tufts. In late stages the glomeruli were completely hyalinized. It appeared that the glomeruli were affected to about the same degree in any given part of the cortex, corresponding to the lobular arterial divisions of the kidney. Convoluted tubules revealed atrophic changes with replacements by fibrous tissue corresponding in degree with the severity of the adjacent glomerular injury. In the fibrous tissue there were always associated foci of lymphocytes. The suprarenal glands revealed relatively thickened medullary zones, intensely chromaffin reactive. The cortical cells were pale and contained lipoid. In some sections, recent extravasation of erythrocytes existed in the medulla.

Special emphasis was placed on a study of small arteries and arterioles obtained in sections of the skin, pectoral muscles, myocardium, thymic tissue, liver, spleen, pancreas, kidneys and prostate gland. In all instances a decreased caliber of the lumen of the vessel was observed. In the smaller vessels the narrowing of the lumen appeared to be almost entirely the result of hypertrophy of the media, but also, in more advanced cases, with proliferation of the intima. In larger arteries, especially in the kidneys, the intimal proliferative reactions were more advanced, and apparently contributed greatly to the narrowing. In extreme instances of narrowing of vessels, hyaline changes were observed in the thickened media and intima of the vessels. The ratio of wall to lumen was usually as great as 1:1, with, not uncommonly, more marked thickening of the wall, especially in the smaller arteries and arterioles of the kidneys and spleen, in which complete obliteration of the lumen of the vessel was common.

Anatomic diagnosis.—1. Hypertrophy of the heart (525 gm., normal 300 gm.; malignant hypertension observed clinically) with dilatation graded 3, and mural thrombosis in the right auricle and in the right and left ventricles. 2. Subacute adhesive pericarditis. 3. Arteriosclerosis of the aorta graded 2, of the coronary arteries graded 1, and of the arterioles graded 3. 4. Atrophy of the kidneys (200 gm., normal 300 gm.), with multiple scars (arterio-arteriolar sclerosis). 5. Pulmonary embolism (source, right side of heart), with multiple bilateral infarcts and formation of abscesses in the left lung. 6. Pyopneumothorax on the left side with spontaneous perforating abscess. 7. Organizing bronchopneumonia. 8. Old and recent thrombosis of the intrahepatic branches of the hepatic arteries, with organizing hematoma in the right lobe of the liver. 9. Recent thrombosis of the left renal artery. 10. Chronic passive congestion of the liver. 11. Edema of the lower extremities and genitalia graded 3. 12. Hypertrophy of the spleen (250 gm., normal 150 gm.) with passive congestion and infarction. 13. Perirenal and perisuprarenal hemorrhages, old and recent. 14. Multiple foci of fatty necrosis in the pancreas. 15. Subacute perforating duodenal ulcer. 16. Emaciation, with decrease in weight from 180 to 120 pounds (81.5 to 54.4 kg.).

COMMENT

This case afforded a most unusual opportunity for study of acute, vasospastic hypertensive disease, with termination as diffuse arteriolar sclerosis. The principal clinical findings were clearly set forth in a previous paper. Although there was no opportunity for us to see the patient during the latter part of his illness, his physician at home offered the following few additional clinical features observed during this period. The patient had much severe abdominal and thoracic pain which could not be controlled adequately

with morphine. Marked dyspnea and also much nausea and vomiting were present, and edema of the lower extremities developed. The terminal illness was characterized more by profound cardiac decompensation than by uremia. The distinctive clinical features of the case, as previously summarized, are recapitulated here, as further aid in correlating the clinical with the pathologic findings: (1) development of malignant hypertension with albuminuria and early renal insufficiency came as a result of vasospasm and arteriolar injury, and not as a result of primary glomerulonephritis; (2) marked arteriolar involvement was proved by study of biopsy of pectoral muscle; (3) vasospasm was the chief factor at the onset, and preceded demonstrable significant arteriolar disease; (4) the diffuse vasospasm involved arteries as well as arterioles, as suggested by the angina pectoris and abdominal crises, although the probability is that angina pectoris in cases like this is not all due to coronary spasm but also to acute cardiac strain, and (5) the history of the onset suggests acute tonsillitis probably of streptococcic origin as the chief etiologic factor.

The existence of severe arterial disease was confirmed at necropsy. Advanced occlusive changes existed in many of the arterioles examined. The arteriolar changes appeared to be primarily the result of hypertrophy of the media of the vessels, but also with intimal proliferation and finally, in some instances, thrombosis. That these vascular disturbances were progressive is disclosed by the two biopsies of pectoral muscles taken at varying intervals, and finally by the changes as revealed by the vessels at necropsy. Narrowing of the vessels as a result of vasospasm was evidently the first demonstrable clinical change. This was followed by hypertrophy of the media of arterioles and smaller arteries, and finally by intimal proliferation and thrombosis, with occlusion of the lumens of many of the vessels. Throughout these stages, hypertension was a clinical manifestation, and appeared to progress in direct ratio with the severity of the vascular lesions. As a result of hypertension, compensatory cardiac hypertrophy supervened.

The heart had attained a weight of 525 gm. at the time of death. As a result of progressive vascular occlusion, the kidneys became involved in ischemic atrophy, and weighed approximately 100 gm. each at the time of the patient's death.

Evidences of myocardial failure and extreme vascular occlusive phenomena with multiple thrombi were the outstanding features in the terminal stages of the illness, as revealed by necropsy. The cardiac muscle had suffered degenerative change which prepared the way for dilatation of the cardiac chambers, allowing mural thrombosis to occur. The lungs became extensively infarcted, and secondary pulmonic infection supervened, as revealed by bronchopneumonia, formation of abscess, gangrene, and pyopneumothorax. Effects of the passive congestion were further disclosed in the liver, which was extremely congested, and in edema of the lower extremities. Thrombosis of the hepatic arteries following extreme passive congestion of the liver undoubtedly had given rise to the unusual picture of hepatic infarction, with hematoma, necrosis, and scarring. This factor, added to perirenal hemorrhage, hemorrhage about the suprarenal glands, thrombosis of the left renal artery, infarction, pneumonia, formation of abscesses in the lungs, and empyema, had no doubt succeeded the vasospastic phenomena as the cause of severe abdominal and thoracic pain in the terminal phases of the illness. Multiple thrombosis of arteries, revealed at necropsy, is unusual, and evidently is dependent on alterations of the vascular walls in association with failing cardiac compensation.

In the early stages of the illness the hypertensive phenomena appeared without clinical evidence of renal impairment, and, as the illness progressed, although renal injury became clinically apparent, there remained a great disproportion between the renal findings and the severe degree of hypertensive disease. Only in the terminal phases of the illness did renal failure become an important factor. Never did it appear to occupy a place of first importance, and to have progressed to the point of producing clinically evident uremia. In the previous report of this case, diagnostic criteria were enumerated, which then, as now, seem to justify our considering this case as an illustration of vasospastic and diffuse arteriolar hypertensive disease rather than of glomerulonephritis. These diagnostic features were: (1) persistently normal urine, for a prolonged period at the onset, (2) normal results from tests of renal function, (3) absence of edema, and (4) absence of anemia. When renal injury became clinically apparent, the hyperten-

sive disease, with associated characteristic vascular and cardiac changes, was well advanced. A diagnosis of primary glomerular nephritis would hardly be tenable in the face of such findings.

Necropsy gave additional proof that we were not dealing with a case of primary glomerular nephritis. The glomerular lesions were not diffuse, such as are characteristic of glomerulonephritis. Zones of relatively normal glomeruli and tubules alternated with zones revealing varying degrees of pathologic change. The glomerular lesions were usually less severe than those exhibited by the arterioles and smaller arteries of the kidneys. The glomerular injury appeared to be of relatively the same degree in the representative glomeruli of the same zone of renal cortex. Differing zones of glomeruli revealed varying degrees of renal injury, thus corresponding in degree to the severity of the vascular occlusive phenomena of a given region. Typical glomerular crescents, as seen in glomerular nephritis, were not revealed. Collections of lymphocytes appeared only in the scar tissue of the atrophic portions of the renal parenchyma. The lesser glomerular lesions disclosed increased cellularity, with thickening of the capillary basement membrane. In later lesions zones of hyaline material appeared in the tufts, and end stage lesions revealed complete hyalinization of glomeruli. Tubular atrophy and replacement of connective tissue corresponded in degree to the completeness of the glomerular condition.

SUMMARY

An unusual case of acute vasospastic disease, terminating in malignant hypertension, has been presented. The report is of additional value, since it was possible to follow the course of the patient's illness from its inception until the end, with, finally, necropsy. The onset of symptoms followed acute tonsillitis probably of streptococcic origin. Vasospasm was the chief factor at the onset of illness and preceded demonstrable arteriolar disease or nephritis. By successive studies made from specimens removed at biopsy and at necropsy, the end-result of the disease has been revealed as diffuse arteriolar sclerosis with cardiovascular and renal failure.

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SPONTANEOUS PNEUMOTHORAX*

REPORT OF CASE

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SPONTANEOUS pneumothorax is encountered frequently by internists dealing with pulmonary tuberculosis, but is rarely seen by the average general practitioner. The term, spontaneous pneumothorax, signifies the presence of air in the pleural cavity and is descriptive of that type of pneumothorax which occurs without any appreciable provocative cause in an apparently normal individual. It is the same as idiopathic pneumothorax.

This idiopathic group is small, and it must include only those cases in which no known cause for the pneumothorax can be demonstrated. In this group the etiologic factor is thought to be the bursting through the pleura of an emphysematous bleb, which has been formed by the gradual but continual undermining of the pleura by air escaping from a ruptured air vesicle, or possibly through a direct tear in the pleura which has been caused by the tug of an adhesion. The actual rupture of the air vesicle may have occurred a long time before the onset of symptoms. This rupture could be caused by some incident in which the intrapulmonic pressure was suddenly and greatly increased. That normal tissue of the lung is susceptible to rupture when put under

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great strain is evidenced by the report of rare instances of pneumothorax in parturition, heavy lifting, playing football and during violent paroxysms of whooping cough.

There are three types of pneumothorax: (1) closed; (2) open, and (3) valvular. The valvular type is practically always the one present in the spontaneous form, because in this type the pulmonic pleura is perforated, the lung collapses, and the tissues in the vicinity of the tear act as a flap or valve. Thus air enters the pleural space easily, but is hindered in its attempt to return to the bronchial system. Air will pass through the flap into the pleural cavity so long as the intrapleural pressure at the height of inspiration is less than that of the intrabronchial pressure at the same time. In this way the intrapleural pressure during inspiration is the same as atmospheric pressure.

The case I present is one of the valvular types of spontaneous pneumothorax.

REPORT OF CASE

The patient, a young man, twenty-one years old, was born in Fillmore County, Minnesota, of Norwegian parents. He had been unusually free from the usual indispositions, fevers, and so forth that most children have during early life. In his early history the only incident which seemed to have any bearing on the case was the fact that the patient had often had the "wind knocked out of him." He had been an unusually rugged boy up to about four months previous to the onset of this attack of pain in the thorax when he had been operated on by Dr. Cabot at the Colonial Hospital, Rochester, for a hydronephrosis of the left kidney due to a congenital malformation of the ureter. This was not tuberculous hydronephrosis.

About 6:00 a. m., January 28, 1931, while stooping over to pull on his overshoes, the patient was seized by a very severe and sickening pain in the left upper portion of the thorax. There was no special exertion connected with this act except for the bending over of 6 feet and 4 inches of a young man. As he was planning to do chores, he put on his coat and cap and started for the barn, but, when he had gone about 50 feet from the house, the pain and dyspnea became so severe that he retraced his steps, and with considerable effort returned to the house.

About fifteen hours after the onset of pain, after the usual home treatment failed to give relief, I was called and the following picture presented itself. The patient had no fever. Respiration was rapid, 38, and there was no respiratory movement on the left side of the thorax. On percussion, the left side was hyperresonant, almost tympanitic. The apex beat of the heart was dislocated to the right side. On auscultation, there was not a sound to be heard over the entire left side of the chest. Vocal fremitus was absent. The right side was also slightly hyperresonant, but the breath sounds were increased and the voice sounds also.

Morphine was administered but gave relief for only six hours, when I was again called. The condition of the patient was very much the same as on the former visit except for some dullness at the base of the left lung. The apex beat seemed to be pushed still further over to the right side. At this time I decided that this was a hospital case, and on the evening of January 29 the patient was brought to the Colonial Hospital, Rochester, where he was taken care of by Dr. S. W. Harrington. Search was made there for tuberculosis or evidence of healed tuberculosis with negative results.

COMMENT

There are several points to be considered in making the diagnosis of spontaneous pneumothorax in this case: (1) The fact that the patient had been an active athlete, played basket-ball and learned to ski about the same time as he started school, and in his own words "had had the wind knocked out of him many times" may be the reason for a weakened structure of the lung (a broken air cell which finally broke through the pleura at this time could easily have been sustained from one of these falls); (2) there was no history of illness during the growing period until the operation for nontuberculous hydronephrosis; and (3) all tests for tuberculosis were negative including roentgenograms of the thorax for the usual remnants of a juvenile tuberculosis. With these points in mind, it seems fair to call this a case of idiopathic penumothorax.

HAZARDS OF IODIZED OIL INJECTIONS

It has been ten years since Sicard and Forestier introduced into medical practice the iodized oils as diagnostic agents. These appeared to offer great possibilities in the localization and definition of certain lesions in the cavities of the body. Occasionally incidents have been reported showing that the injection and retention in the body of these oils are not without danger. In a recent issue of THE JOURNAL, December 3, 1932, p. 1946, appeared a report of the Council on Pharmacy and Chemistry dealing with the dangers of the injection of iodized oils. The report emphasized anew the necessity for a policy which has guided the Council in its deliberations over the past quarter of a century; namely, that of insisting on due caution in the use of all new methods and preparations until their potentialities for doing damage have been subjected to the test of scientific scrutiny. (Jour. A. M. A., January 7, 1933, p. 46.)

PRACTICAL DIABETIC DIETS*

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A REVIEW of American diets, whether for disease or as epochs in the evolution of civilization, is an interesting study. This is especially true of carbohydrates. It has been estimated that in 1823 each person consumed about 8.8 pounds of sugar a year. At that time, because of its cost, it was used principally as a condiment. In 1930 the human consumption of sugar was 108 pounds per person. This difference is about 450 calories a day. Today sugar has become so important an item in our diet that nearly one-sixth of our energy comes from this source. We have even attempted to refine our carbohydrates to such an extent that many of the necessary elements have been removed. As you know, many diseases due to the lack of vitamins have been attributed to this. Polished rice and milled cereals, such as white flour, breakfast foods, and corn starch, are such articles.

Recently we have seen the scientist swing the pendulum back to roughage and unrefined products in order to hold these properties. Through advertisements there is no housewife who does not think vitamins and roughage are necessary in the household diet. These items have become a fad in our daily habits, whereas a few years ago we talked in terms of calories. We have forgotten the pioneer American demanded meat dishes. Mendel has stated that if you look over hotel menus of 1850 you will likely find two choices of meat soups, two of fish, twelve of meat (six boiled and six roasted dishes), with only ten vegetables and four desserts. But gradually during these eighty years we have desired more desserts, and, typical of the American slogan of the go-getting Yankees, we got what we wanted. It is peculiar how closely this has been attached to success, and the less the financial embarrassment in this country the more we have demanded sweets. Today no American meal is complete without either ice cream, pie, cake, or éclairs.

It is only necessary to travel in England or on the continent to note the difference in the desires between the average European and American table. Protein is still their main article of diet. Housewives in our country, as a rule, provide a diet of three-fifths carbohydrate, one-fifth protein, and one-fifth fat, giving enough vitamins and roughage to care for our needs in other elements besides calories. Thus the American diet has changed from excessive protein to excessive carbohydrate in recent years. Since the war we have seen another wave of enthusiasm for the so-called obesity diets. This has been deemed necessary by dictates of fashion, and round curves have been changed to angular ones. The American idea of beauty demanded a slim body. Compare that idea with the standard of body beauty among the South Africans and the Eskimos.

Today through advertisements we are beginning to leave the low caloric diet, and vitamins have been pushed somewhat in the background. We are beginning to take a stand midway between the two extremes.

This same changing picture is just what has occurred in the treatment of diabetes in this same period. A few years ago we talked about high fat diets, thinking we had reached the height of success in the treatment of this disease. Within the last year certain medical scientists have advocated the other extreme, or high carbohydrate, low fat diet. A doctor is an individual trying to serve, as does the housewife, in reaching some sense of perfection. We cannot criticize him for his changing ideas when we consider how much we have changed the diet of the so-called healthy individual during this period. As the result, all individuals of the last fifteen or twenty years, whether ill or well, have seen a marked change in food requirements. There is no field in which opportunity for dogmatism and quackery is so prevalent as in the domain of our daily diet.

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Since 1914 we have seen the diabetic diet become more liberal in total calories. Then modified starvation in some form was used. The severe diabetic patient was still a pathetic individual. Our only attempt to keep him alive was with a low caloric diet which was supposed to lower his basal metabolic rate. In the end, acidosis was our greatest enemy. Early in 1920 Newburgh and Marsh came forward with some new ideas which brought to our attention the high fat, low carbohydrate diet. This diet allowed the patients to put on weight, and they again became normal looking human beings. There were certain features of this regime which were questioned for quite a period of time. Through the careful work of Wilder on severe diabetic patients it was shown that many of Newburgh's ideas were correct. Wilder definitely determined that the protein intake in the diabetic was a factor that regulated the basal metabolic rate of the individual. In other words, by increasing or decreasing the amount of protein in the diet we could increase or decrease the metabolic rate of caloric consumption. He also found that under rest, and enough calories from carbohydrates and fats, two-thirds of a gram of protein was sufficient to maintain nitrogen balance. Most adult patients, exercising in the usual manner, use about one gram of protein.

Woodyatt had also determined previously that there was a certain amount of glucose necessary to combust the fatty acid radicals under severe acidosis. This ratio was about 1 or 1.5 to 1, but by prolonged treatment, after the diet was established, we could use a higher ratio of 2 or 2.5 to 1, and still not have acidosis occur. As a result the high fat diet gave the diabetic patient an opportunity to keep himself around a normal weight for his height and age. Today many diabetic individuals appear as robust and healthy as normal people.

About this time insulin was brought forward by Banting. This again changed our method of dieting, and especially helped the severe diabetic patient who could not live with any material happiness on the high fat ratio that was present in the old diet. With insulin the longevity for these unfortunate individuals was increased to nearly a normal period of life. As a result over the last seven to eight years our diabetic patients have been accumulating in the world, and many have reached an age in life where death would normally occur. Cardiovascular complications are usually present in these individuals at the time of their death. Joslin has shown that before the introduction of insulin acidosis caused 85 per cent of the deaths of diabetics. Today it accounts for only 10-20 per cent. Many deaths are said to be due to diabetes, when really it is only the contributing factor to the final cardiovascular accidents that occur in these individuals. Many times these individuals reach three score years and ten, and their death comes from natural causes not directly associated with diabetes. Since diabetes is one of the diagnoses given on the record we have a rather confusing picture in mortality statistics.

After the introduction of insulin, we gradually increased the amount of calories these patients were allowed, usually allowing more carbohydrates, which in turn gave a low ratio between the glucose and fatty acid radicals. There have been levels arbitrarily established for these individuals. Joslin, for example, is in the habit of allowing usually between 100-125 grams of glucose in the diet, giving enough insulin to cover the necessary requirements. He has always been more careful to keep a lower fatty acid glucose ratio than have other diabetic clinics by not allowing the patient's diet to become greatly restricted in carbohydrates. He claims this has been a definite factor in keeping them on their necessary diet without periods of over-eating. During the last few years Sansum and Rabinowitch and their workers have gradually increased this amount of carbohydrates, and have allowed diets consisting of somewhere around 200-300, or even more, grams of carbohydrates daily. This has made it necessary for the patient to use a larger amount of insulin to cover this increased carbohydrate intake. Much to our surprise the amount of insulin required was not doubled as the amount of carbohydrates was correspondingly increased. Sometimes on a markedly higher carbohydrate diet the insulin has only been increased 30-40 units. This is one factor which has given the physician the impetus to use higher carbohydrates than necessary to maintain caloric and nitrogen balance. In the end it returns to the regime that is now present among the American people of using a high carbohydrate diet. There are certain features of this diet which I shall discuss later in this paper.

Therefore, reviewing the diets that have been

used during this period, we see that a high fat, low carbohydrate diet is one extreme; another extreme is a high carbohydrate, low fat diet which is very much in vogue in certain diabetic centers at the present time. This leaves someone to advise a high protein diet as the best regime, and this has been done by Porges of Vienna. There are certain features in a high protein diet which are not as desirable in the United States as in Europe. It is more the diet of the pioneer American fifty to seventy-five years ago and of the European countries at the present time. For that reason it probably is the desired diet for certain types, groups, or races, but in this country it is not particularly desirable. Most Americans prefer to live on a low protein intake. This they have done of their own accord, as discussed in the early part of this paper. The average American desires a high carbohydrate intake. If a larger amount of protein is used, we are going to have an increase in the metabolic rate of the individual, which demands more calories and a larger amount of insulin. If these factors are kept in mind it is probably of no greater harm to the individual than our high carbohydrate diets mentioned above.

This gives somewhat a review of diabetic diets over the same period in which we have seen changes in the diet of the healthy individual. It is surprising how closely the two coincide. Of course the diabetic is becoming a normal individual with the use of insulin, and naturally he is going to follow in the footsteps of his healthy associates.

As a result we have become neglectful of two facts in the treatment of these individuals. First, there is a waste of calories in order to satisfy a desire, or because of a lack of stamina to follow the principle and treatment we know are best for this group of patients. Second, there is the financial loss due to the large amount of insulin used. In this period of depression it is an important factor in budgeting the poor man's income. Patients in the dispensary of the University Hospital are complaining of this condition. During the last year the high carbohydrate diets were used in the hospital. These patients were many times allowed to return to their homes on a diet between 200-300 grams of carbohydrates, and necessarily larger amounts of insulin. Within a few weeks they were seen in the dispensary. Their cry was the enormous amount of money that had to be expended to keep them on their diet.

If patients are going to use indiscriminate amounts of insulin there are other dangers that have to be considered. The larger the amount of insulin taken, the more shock to the system if it is suddenly discontinued. Very often we see this done with disastrous results in reliable institutions where a patient's insulin is suddenly cut from a high amount to a very few units per day. This is especially true if the patient is running a temperature, seriously ill, or taking little or no food. When the patient has an acute respiratory infection, whether a cold or pneumonia, the insulin is more important than the amount of food ingested. We have all seen reliable physicians discontinue insulin during periods of serious illness or injury. This has increased the acidosis to such a great extent that the patient's death was not due to the severe condition that brought him to the hospital. Patients on a lower diet and less insulin are less apt to develop this condition.

After adjusting their diets to a lower carbohydrate intake some of these individuals have become sugar-free without insulin but still are allowed 125 grams of carbohydrate intake daily. Many of these individuals have had to apply to county and public relief for financial help. It seems to me this money could be used to a better advantage if it were spent for more desirable food rather than for insulin. Individuals in the upper stratum of life also have complained of the expense, and have found they are getting more carbohydrates than they desire. They feel stuffed and uncomfortable; they are making more or less the same complaint that a patient did a few years ago on a high fat diet. Regardless of whatever injury this diet might cause, I feel it is not practical from an economic standpoint. Of course I do not mean these individuals should be allowed to lose weight by restriction of total calories, but a relatively higher amount of fat could safely be used in their diets with a restriction in the carbohydrate intake and a smaller amount of insulin.

Many elderly diabetic patients are apt to ask for a diet which will not necessitate the use of insulin. There are certain factors in the treatment of elderly individuals which make it desirable not to keep them too low in glycosuria, or blood sugar. It has been stated by Joslin that years ago in his over-zealous enthusiasm he felt

he had brought about a sudden death of an elderly diabetic. The patient being put on a markedly restricted diet, became sugar-free suddenly, with a hypoglycemia, and died in a cardiac attack, probably angina.

I feel it is very essential that each elderly diabetic patient should have a thorough examination of his heart, including an electrocardiogram, to determine if he is not a potential case of angina pectoris, which might occur during treatment. The old idea that severe starvation was not good for an elderly diabetic holds just as true today as it did formerly. Many of these individuals have had attacks of angina while under a relatively high diet with large amounts of insulin, which combination brought about the same condition that we feared under the old regime. I therefore feel many elderly diabetics are better if allowed to have a small amount of glycosuria constantly. It has been shown recently by Strouse that many of these individuals develop their anginal attacks during periods of relative, or true, hypoglycemia. We realize a diabetic individual over the age of forty usually shows an arteriosclerosis of his vessels, which can be demonstrated by X-ray of the vessels of the feet, or by electrocardiographic investigation.

Most elderly patients do not care for as much food as younger individuals. They are usually willing to stay on a diet as outlined under Diabetic Diet No. 1. You will note that this allows a little bread, oatmeal, or potato, each day, even though it is restricted in carbohydrate. This diet is usually very acceptable to the obese individual. At times, of course, we may even restrict the fats to 100 grams.

Two other diets as outlined in the charts are also used. I feel most individuals are happy on a diet somewhere between 100-140 grams of carbohydrate. The ability to take these diets without the use of insulin indicates a great deal milder case. Most patients on as high a diet as outlined in Diabetic Diets No. 2 and No. 3 usually need some insulin. It has been our experience in the University Diabetic Dispensary that it is unusual to require more than 25-40 units a day except in the very severe cases. The caloric requirements in all three diets can be increased or decreased in amount, depending upon the necessary caloric intake for the individual.

The necessary intake, or basal diet, depends upon the individual's height, weight, and age.

DIABETIC DIET NO. 1

C. 65 gms.; P. 65 gms.; F. 150-200 gms.; Cal. 1870-2320

Breakfast:	*Amt.*	*Gms.*
10% fruit	1 serving	100
Bacon, cooked	4 strips (3¼")	15
Egg	1	50
Cream, 20%	½ cup	113
Dinner:		
5% vegetable	1 serving	100
10% vegetable	1 medium serving	84
Meat (lean)	1 serving	100
10% fruit	1 serving	100
Mayonnaise	2 tbsp.	50
Butter	2½ squares	25
Cream, 20%	½ cup	113
Supper:		
5% vegetable	1 serving	100
10% vegetable	1 medium serving	84
Eggs	2	100
10% fruit	1 serving	300
Mayonnaise	2 tbsp.	50
Butter	2½ squares	25
Cream, 20%	½ cup	113
To the above add ONE ONLY of the following:		
Bread, or	1 slice (¼" thick)	20
Oatmeal, cooked, or	⅜ cup	90
Potato	½ (2½" diam.)	50

DIABETIC DIET NO. 2

C. 100 gms.; P. 65 gms.; F. 200 gms.; Cal. 2460

Breakfast:	*Amt.*	*Gms.*
10% fruit	1 serving	100
Bacon, cooked	4 strips	15
Oatmeal, cooked	½ cup, scant	100
Toast	½ slice (¼" thick)	10
Cream, 20%	1 cup	226
Butter	½ square	5
Dinner:		
5% vegetable	1 serving	100
Potato	1 (2½" diam.)	100
Meat (lean)	1 serving	100
Butter	2 squares	20
Cream, 20%	¼ cup	56.5
Mayonnaise	2 tbsp.	25
10% fruit	1 serving	100
Supper:		
5% vegetable	1 serving	100
10% vegetable	1 large serving	150
Eggs	2 medium	100
Mayonnaise	2 tbsp.	25
Bread	1 slice (¼" thick)	20
Cream, 20%	¼ cup	56.5
10% fruit	1 serving	100
Butter	2½ squares	25
Cereal Substitutions		
Oatmeal, cooked	½ cup, scant	100
Farina, cooked	½ cup	100
Cornflakes	½ cup	14.2
Shredded Wheat	½ biscuit	14
Bacon Substitutions		
Omit Bacon, cooked	4 strips, 3¼"	15
And add Egg	½ medium	25
and butter	½ square	5
Egg Substitutions (Supper)		
Omit Egg	1 medium	50
and Butter	½ square	5
And add American cheese	1 cube	25

DIABETIC DIET NO. 3

C. 140 gms.; P. 65 gms.; F. 200 gms.; Cal. 2620

Breakfast:	*Amt.*	*Gms.*
10% fruit	1 serving	100
Toast	1 slice (¼" thick)	20
Butter	1 square	10
Oatmeal, cooked	½ cup, scant	100
Cream, 20%	1 cup	226
Bacon	4 strips (3¼")	15
Dinner:		
5% vegetable	1 serving	100
Potato	1 (2½" diam.)	100
Meat (lean)	1 serving	100
Bread	1 slice (¼" thick)	20
Butter	2 squares	20
Mayonnaise	2 tbsp.	25
15% fruit	1 serving	100
Cream, 20%	¼ cup	56.5
Supper:		
5% vegetable	1 serving	100
Either {15% vegetable or	1 serving	100
{10% vegetable	2 servings	200
Bread	2 slices	40
Butter	2 squares	20
Mayonnaise	2 tbsp.	25
Eggs	2	100
Cream, 20%	¼ cup	56.5
15% fruit	1 serving	100
Cereal Substitutions		
Oatmeal, cooked	½ cup, scant	100
Farina, cooked	½ cup	100
Cornflakes	½ cup	14.2
Shredded Wheat	½ biscuit	14
Bacon Substitutions		
Omit Bacon, cooked	4 strips, 3¼"	15
And add Egg	½ medium	25
and Butter	½ square	5
Egg Substitutions (Supper)		
Omit Egg	1 medium	50
and Butter	½ square	5
And add American cheese	1 cube	25

The amount of calories can be determined from Sandiford's and Boothby's old graphic chart or can be figured from Dubois' scale, which is found in any reliable book on metabolism. As a rule, the individual should be allowed about 50 per cent more than his basal requirement, which generally is in the neighborhood of 1800-2400 calories a day. All three of these diets can be easily changed to give any possible change in calories. This is usually done by increasing or decreasing the fat in the diet.

There are a few individuals, for example travelling men, who eat in hotels and restaurants and find it almost impossible to stay on a restricted diet. Under these circumstances their carbohydrate intake is around 175-190 grams. This is about all that any individual can ingest unless food is taken in a very concentrated form. If they are willing to stay on a diet of 175 grams, it is easy for them to pick out such a diet from any hotel menu. Any diabetic individual who is interested in his diet at all will be able to omit weighing his food to the exact number of grams outlined in any diet in a very short time. By observing how much makes a tablespoonful and a cupful, he soon has a very good idea of what the weight of his food should be. I do feel that each diabetic in beginning his first course of lessons should be made to weigh his food in order to learn what the weight of an average helping is. I believe it is unusual for any patient in the University Diabetic Dispensary or in my private practice to weigh his food within two months after his diet is established.

You will notice the portions allowed in these diets are listed under two headings, Amount and Grams. This makes it fairly easy for the patient to follow his diet within ten to fifteen grams of his intake each day. If he is using insulin the variation of his diet up and down from day to day is not of sufficient importance for him to weigh his food. This does not mean that his urine should not be tested daily. If it is found that he is showing an increasing amount of sugar, he should be more careful for a few days in order to clear up a moderate amount of the glycosuria. It is a very unusual individual who needs a diet of 175 grams of carbohydrates. This is not a marked restriction. During the last year it was found in a number of hospitals that the average diet of the internes and nurses in most institutions is somewhere between 125-140 grams of carbohydrates, 65-90 grams of protein, and about 100-200 grams of fat. If these healthy individuals can live on this diet, there is no reason why a diabetic individual, living on this diet and eating because of his disease, should not accept a low carbohydrate intake. I feel it is the rare individual who should be given a higher intake of carbohydrates, which in turn usually means a larger expenditure for insulin.

My only plea in offering this paper is to bring to your attention the laxity of the patient toward his diet, and the loss of responsibility of the physician to his patient that has developed in the last one to two years in the treatment of this disease. The physician should teach the individual as much as possible about food values, how to figure diets, and how to test urine. He should not discharge the patient from his mind after giving

him a syringe and a bottle of insulin. This may be carrying the picture a little bit too far, but I have seen cases in which this procedure has more or less been followed. I personally am not in favor of the relatively high carbohydrate diet which is used in some institutions with a larger amount of insulin. I feel in looking over the history of diets for individuals in health and in disease that the pendulum will probably gradually swing back half way between the relatively high fat diet of yesterday and the relatively high carbohydrate diet of today, and in the end our patients will be receiving diets somewhere between 100-150 grams of carbohydrates each day.

CONVULSIVE STATES IN ADULTS FROM THE NEUROLOGICAL STANDPOINT*

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CONVULSIVE states comprise those disturbances of the motor system associated with sudden, violent, localized, or widely distributed discharges of motor energy, usually accompanied by loss of consciousness followed by a period of exhaustion, stupor, or sleep. They may occur in any period of life from infancy to old age and represent a clinical syndrome caused by many different etiologic factors. Frequently convulsions in infancy do not present the grave significance as in adults, because of the generally recognized theory that during the first two years of life the cortical centers do not develop their inhibiting functions. Prior to this period the lower centers are in full control and the reflex irritability is correspondingly greater. For this reason apparently healthy infants often suffer from convulsions due to slight and unimportant causes. Nevertheless, convulsions in infants and children should never be treated lightly, for as Patrick and Levy[1] have pointed out, records of early convulsions were found in about 20 per cent of 500 epileptics. In a similar article by Thom,[2] 55 per cent of 111 epileptics gave a history of a convulsive seizure before the fourth year.

Due to the greater stability of the nervous system and due to the normal inhibitory control of the cerebral centers in the adult, an initial convulsion during this period of life always is either a forerunner of, or associated with, a grave constitutional disorder or with an acute or chronic inflammatory infectious, degenerative, or proliferative cerebral disease. For that reason every convulsion in the adult without any previous similar history frequently requires the most careful and thorough clinical, chemical, and sero-biological studies to determine its etiologic factor.

In recent years several articles have been written on pathologic disorders associated with convulsions. Cobb[3] in his classification enumerates 56 diseases. The major portion of his neurological conditions were placed in groups wherein edema, increased intracranial pressure, and anoxemia play an important rôle. Foerster[4,5] limits his list to organic neurologic diseases and gives eighteen groups. The following classification, although incomplete, comprises the disorders which are frequently associated with convulsive seizures in the adult, and which are commonly encountered in the routine practice of medicine.

1. Constitutional Disorders
   a. Uremia
   b. Toxemia of pregnancy
   c. Cardiac decompensation
   d. Stokes-Adams syndrome
   e. Tetany
   f. Alkalosis
   g. Pernicious anemia
2. Acute Cerebral Disorders
   a. Meningitis (various types)
   b. Encephalitis (various types)
   c. Cerebral trauma
   d. Vascular lesions (hemorrhage, thrombosis, embolism)
   e. Cerebral abscess
3. Chronic Cerebral Disorders
   a. Brain tumor
   b. Cerebral syphilis
   c. Cerebral arteriosclerosis
   d. General paresis
   e. Multiple sclerosis
4. Acute and chronic intoxication (alcohol, lead, strychnine, etc.)
5. Epilepsy (idiopathic)
6. Epilepsy (Jacksonian)
7. Migraine
8. Raynaud's disease and allied disorders

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The group of constitutional disorders in which the convulsions are not on a neurological basis must always be considered in the differential diagnostic problem. The advances made in the studies of the blood chemistry, of the routine blood examinations, of the electrocardiogram, of endocrine imbalance, and so forth, have clarified many a case of so-called idiopathic epilepsy and placed it in its proper category.

Cobb[5] groups five conditions in which the convulsive seizures are precipitated by anoxemia of the brain. The first is the Stokes-Adams syndrome, in which, according to Mackenzie,[6] a heart block of seventeen seconds duration will precipitate convulsions. Similarly, paroxysmal tachycardia may be associated with convulsive attacks. Carbon monoxide poisoning and mechanical asphyxia as in strangulation frequently produce convulsions on a similar basis. Seizures may occur in pernicious anemia, due to the anoxemia of the nerve cells. The attacks developing with uremia and puerperal toxemia are evidently due to an associated cerebral edema.

CASE REPORTS

Case 1.—Uremia with convulsions.

B. E., a physician, aged 54, married, was seen in consultation with Dr. J. N. Gehlen on August 29, 1931. His family history was negative. His personal history was negative except for typhoid fever and pneumonia at 20. For a year he had had an occasional attack of indigestion which gradually became more pronounced. In November, 1930, this became associated with marked hyperacidity and gastric distress. In January, 1931, he consulted the Mayo Clinic and a duodenal ulcer was diagnosed. He was placed on an ulcer diet with marked relief of symptoms. Since that time he has been taking small amounts of alkalies regularly. During the week of August 23, 1931, while on a strenuous business trip his gastric symptoms became quite severe and he required large doses of alkalies for several days. On August 26 he developed a tonsilitis, fever, chills, and severe headache. These symptoms became more pronounced in twenty-four hours, his vision blurred, his headache intense, and he vomited. He continued with his alkaline treatment. On August 29, about 10 a. m., he had a generalized convulsion. At 12:15 p. m., he had recovered and dictated several letters. Soon after, his convulsions recurred, became continuous, and he was in a moribund state when admitted to the hospital at 2:30 p. m. The convulsions continued, his pupils were pin-point, pulse 160, temperature 102. He was anesthetized to control the convulsions; 1000 c.c. of normal saline were given intravenously because of the probable diagnosis of alkalosis. A lumbar puncture was done and 40 c.c. of clear spinal fluid under marked pressure were removed. The convulsions ceased, but irregular twitchings of the face and shoulders continued and the patient was delirious off and on for several days. The neurological examination was negative throughout except for miotic pupils.

The spinal fluid was negative. Blood: w.b.c., 17,900; differential count, normal; blood sugar, .104; creatinine, 2.19; urea nitrogen, 25.4; urea, 54.3; chlorides, .713; Van Slyke CO_2, 67%. Urine, normal except for some albumin and a few hyaline and granular casts. Blood pressure, systolic 140, diastolic 80.

He was placed on sedatives and elimination and restricted diet. His pulse and temperature gradually returned to normal. He was discharged from the hospital on October 8, 1931. He has remained well and attended to his practice to date except for a tonsillectomy on November 16, 1931.

Case 2.—Brain tumor diagnosed puerperal eclampsia.

Mrs. E. O., aged 36, married, seen in consultation on March 10, 1929, gave a negative family and personal history.

She had passed through two previous uneventful pregnancies and given birth to healthy offspring. Her third pregnancy was uncomplicated during the first six months. About the seventh month she developed headaches, which gradually increased in severity. About one month later these became associated with an occasional attack of vomiting, and at times a slight trace of albumin in the urine. Blood pressure varied around 130 systolic, and 70 diastolic. Blood chemistry was normal. On the day of her delivery she had a severe generalized convulsion. A diagnosis of puerperal eclampsia was made. Several hours later she was delivered of a normal healthy child. Her convalescence was uneventful except that the headaches continued in severity and on the fourth day she had another generalized convulsion. During the following two weeks she had three similar attacks and about this time she manifested some weakness and awkwardness of her left upper extremity. A neurological examination at this time revealed a moderate bilateral choked disc. All other cranial nerves were normal. The right upper extremity was normal throughout. The left manifested some ataxia and hypertonicity, moderately increased reflexes, normal sensation; muscle strength fair. The right lower extremity was normal throughout. The left showed a moderately increased knee and ankle jerk and a positive Babinski. Sensation was normal. The abdominal reflexes could not be elicited because of flabby musculature. Urine was normal. Blood pressure, systolic 130, diastolic 76; blood Wassermann, negative. The spinal fluid pressure was somewhat increased, showed a count of 3 cells, a trace of globulin, a negative Wassermann, and a negative colloidal gold curve.

A diagnosis of a brain tumor in the right motor area was made. A decompression operation over this region revealed an inoperable infiltrating tumor, probably a glioma.

The acute cerebral disorders which are associated with convulsions frequently present a definite neurological syndrome suggestive of an

organic disease. Among these are the Kernig sign, rigid neck, oculo-motor disturbances, hemiplegia, reflex changes, temperature, etc. For that reason, the fundamental disease can be usually diagnosed. In meningitis, encephalitis, and cerebral hemorrhage the acute onset and the virulent course readily distinguish these conditions, when associated with convulsions, from an essential epilepsy. Blood studies and spinal fluid examinations often definitely determine the underlying etiology. Lumbar punctures are readily resorted to because it is apparent that the convulsion is simply a part of the acute syndrome.

In the chronic cerebral disorders the convulsion itself may be the *only* outstanding symptom for a period of months, or even years. A cursory neurological examination reveals no abnormal reflex changes, and a diagnosis of hysteria or essential epilepsy is made. Every adult with an initial convulsion, regardless of the neurological findings, is entitled to the benefit of spinal fluid studies, of complete examination of the blood, fundi, fields of vision, and so forth, to determine the underlying etiologic factor. Cerebral syphilis and general paresis occasionally manifest convulsions for some period prior to the development of other signs. Brain tumors may have convulsive seizures as their first symptom for months or years before further manifestations present themselves. Parker[7] in a series of 313 cases of brain tumor encountered major epileptic seizures in sixty-seven (21.6 per cent). Convulsions occurred as an initial symptom of the disease in thirty-eight patients, thirteen of whom gave no other complaint for one or more years. Prichard[8] reports five cases in which a brain tumor gave rise to generalized convulsions and to status epilepticus for many years (in Case 1 for eighteen years) before any other signs indicating a local cerebral lesion were detected. He believes that these tumors are slow growing and usually located subcortically. Gotten[9] suggests the use of encephalography as a diagnostic measure in cases of late epilepsy. By these means a clear concept of the pathologic condition is usually demonstrable and it offers a most important aid in the differential diagnosis.

Cerebral arteriosclerosis probably presents one of the most difficult diagnostic problems in this group of chronic cerebral disorders. Convulsive seizures may manifest themselves during any stage and are on the basis of either an anoxemia due to impaired cerebral circulation or a temporary cerebral spasm. Woltman[10] called attention to the fact that arteriosclerosis may occur primarily in the cerebral blood vessels without any demonstrable clinical evidence in the general arterial system, and without any associated hypertension. Although this disease is frequently encountered in the degenerative period of life, cerebral arteriosclerosis may occur at any age. In discussing Woltman's paper, the writer reported a case of a boy, aged 19, who died of a cerebellar tumor. Postmortem examination revealed the tumor in the right cerebellar lobe, along with marked arteriosclerosis of the cerebral blood vessels, especially the circle of Willis. Barron of Minneapolis at the same meeting reported a case of a girl, aged 13, who died of cerebral hemorrhage. Postmortem revealed advanced atherosclerosis of the arteries, especially marked in the cerebral vessels.

Examination of the fundi must never be neglected, since retinal arteriosclerosis always means an associated cerebral arteriosclerosis; the reverse, however, is not necessarily true. Vertigo, headache, and slight personality changes, or even mental impairment, are the most frequent and constant early manifestations. A normal blood pressure has no special significance, as a large percentage never manifest hypertension of any degree during the entire course of the disease. In Woltman's[10] series of 146 cases, 64.4 per cent had a mean pressure of 130 systolic and 78 diastolic.

Case 3.—Cerebro-spinal syphilis with convulsions.

S. M., female, single, aged 43, a teacher, was seen in consultation with Dr. J. B. Brimhall, St. Paul, April 3, 1926.

Her family history was negative.

She had had an appendectomy in 1912. She denied venereal disease and exposure. Her hymen was intact.

Early one morning in March, 1925, at the age of forty-two, she had a fainting sensation, fell from a chair, and was unconscious for several minutes. She recovered but had to remain in bed for twenty-four hours because of marked general fatigue and severe headache. She remained perfectly well until November, 1926, when she had a similar attack. Her third convulsion on January 25, 1926, was more severe. For three hours previous she had a smothering sensation and a "lump feeling" in her throat, followed by unconsciousness and generalized twitchings. She regained consciousness in about one-half hour, but had to remain in bed for one week because of severe headache and marked fatigue. These attacks recurred about every two weeks. In the interval she was well and attended

to her duties. There was no bladder disturbance, nausea, or headache.

The physical examination was negative throughout.

The neurological examination revealed both pupils equal, round, and responded normally to light and accommodation. The fields of vision and fundi were normal. All other cranial nerves and upper extremities were normal. The Romberg was negative. The lower extremities were negative throughout except for moderately increased but equal knee jerks and a right positive Babinski.

Hemoglobin was 80%; blood pressure, systolic 128, diastolic 90; urine, normal. Blood Wassermann was negative. A diagnosis of a probable brain tumor was made and spinal fluid examination advised. The spinal fluid was clear, under moderately increased pressure, a cell count of six, globulin positive, Wassermann 4 plus, colloidal gold curve in the luetic zone. Diagnosis, cerebral lues.

She was placed on intensive antiluetic treatment with repeated spinal drainage. Her spinal fluid became negative after six months' treatment. Her attacks became less in frequency and severity and her last spell occurred July 1, 1927. The last examination on July 3, 1932, was negative throughout except that her knee jerks were sluggish. Her spinal fluid was normal and she has been free from attacks for five years.

Case 4.—Epilepsy on a syphilitic basis.

B. F., a male, aged 38, a farmer and single, was seen in consultation with Dr. C. E. Harkey at the U. S. Veterans Hospital in May, 1924.

His family history was negative. His personal history was negative except that he contracted gonorrhea at the age of 22.

In 1922, at the age of thirty-six, he suddenly had an attack of unconsciousness associated with a generalized convulsion. These attacks would occur at irregular intervals averaging about six during 1922 and nine during 1923. There was no special change in the character of the convulsions. Of late he had developed some vertigo and dull headache. His bladder and sexual functions have been normal.

The physical examination was negative.

The neurological examination was negative except that the left pupil was larger than the right, and it did not respond to light. The other cranial nerves, fundi, reflexes, sensation, and so forth, were normal. The routine laboratory tests, including a blood Wassermann, were negative. The spinal fluid was under increased pressure, contained 29 cells to the c. mm. and showed a positive globulin, a positive Wassermann, and a leutic colloidal gold curve.

He was placed on intensive antiluetic treatment with repeated spinal drainage. Although the spinal fluid gradually returned to normal, his seizures continued, although less severe, and with the addition of luminal became less frequent.

The pupillary findings in this case strongly suggested the etiologic factor.

Case 5.—Brain tumor with convulsions for twelve months prior to other symptoms.

C. F., a minister aged 48, married, was seen in consultation with Dr. G. M. Dill, Prescott, Wisconsin. His family and personal history were negative.

On March 12, 1927, he had a generalized convulsion without any constitutional manifestations. He suddenly became unconscious, had a grand mal seizure, recovered in about ten minutes, had a headache for an hour, then was perfectly well. He had a similar attack on April 27 and another one on June 7. There were no other complaints or symptoms. Examination on June 12, 1927, was negative throughout. Cranial nerves, fundi, reflexes, and so forth, were normal. Hemoglobin 82 per cent; leukocyte count, 8,200; blood pressure, systolic 135, diastolic 70; urine, normal. The blood Wassermann was negative. The spinal fluid was under normal pressure, clear, 3 cells, a trace of globulin, Wassermann negative, colloidal gold test negative. He was placed on phenobarbital and was free from convulsions for six months. On February 6 and March 4, 1928, he had three marked seizures. About one week later he developed some weakness and ataxia of the right arm and an occasional headache. A few weeks later some difficulty in his right leg manifested itself in that it was awkward and tired easily.

Examination on March 20, 1928, was negative except for impaired motor strength in his right arm and right leg. The deep reflexes were increased, there was a positive Babinski on the right side, some ataxia with the finger-to-nose and heel-to-knee tests. The right abdominal reflexes were sluggish; the left, normal. Sensation was normal. The fundi and fields of vision were normal. The spinal fluid was normal except for increased pressure.

A diagnosis of brain tumor, left Rolandic area, was made. A decompression operation revealed a tumor over this area. It was well defined, but infiltrating (a glioma), and could only be partially removed.

EPILEPSY AND MIGRAINE

The initial convulsion in essential epilepsy occurs in the greatest majority of cases in infancy or early childhood. In some of the older textbooks an arbitrary age limit of up to thirty-five years is given, prior to which time the first attack may occur. Any initial attack manifesting itself at a later age was considered due to some structural disturbance and not on an idiopathic basis. Rarely, however, essential epilepsy may occur later and has been designated as "epilepsie tardie" or late epilepsy. In a careful investigation of the past history of such patients one frequently obtains symptoms suggestive of a developing epilepsy. Many so-called mild hysterical attacks in the young are undoubtedly abortive seizures and only later in life major convulsions manifest themselves. Frequently unrecognized petit mal attacks occur over a prolonged period. Muskens[11] believes that slight myoclonic twitchings, short

periods of unaccountable fatiguability, the persistent Chvostek sign, vasomotor phenomena, such as marked blushing or pallor, and similar manifestations in the young, may be prodromal symptoms of a late oncoming epilepsy.

Migraine, similarly, may manifest itself for years and in later life be associated with epileptic seizures. Occasionally the convulsions apparently replace the migraine and no further headaches occur. Ulrich[12] in a series of 500 migraine patients reports an associated epilepsy in 12 per cent. Flatau[13] in a similar series found 7.2 per cent. He believes that in migraine patients with marked ocular phenomena subsequent convulsive seizures are more prone to develop.

The convulsive seizures of an essential epilepsy rarely assume the characteristics of a Jacksonian type. This form, however, is frequently on the basis of some definite localizing cerebral lesion, usually in the sensori-motor area, and may occur at any age, depending upon the development of the pathologic process. The diagnostic signs of a Jacksonian convulsion are: (1) That the convulsion always has its onset in the same location; (2) that the progress of the motor involvement corresponds to cerebral localization; (3) that the extremity first involved frequently manifests some temporary impairment of function, subsequent to the seizure; (4) there may or may not be an associated unconscious period.

The following cases are illustrative:

Case 6.—Migraine in early life with subsequent epilepsy.

A. M., a male, aged 32, single, and a carpenter, was seen February 26, 1929.

His family history was negative except that his father had suffered from diabetes for years, and his mother and maternal grandmother had had migraine.

His past history was negative except for the usual childhood diseases.

At the age of three he began to develop periodic headaches, which would occur at irregular intervals, averaging about fourteen a year. He described them as follows: His vision would suddenly become blurred associated with a buzzing sensation in his head. Soon after he would see flashes of light, usually of a red color, accompanied by pain in his right shoulder, gradually extending to the right side of his head. Then the headache would become very severe, and he would have nausea and vomiting. The severe headache continued for from two to twelve hours, then would gradually subside.

In March, 1927, at the age of thirty, he suddenly developed a generalized convulsion associated with unconsciousness, and since then he has had five major attacks, the last one occurring February 20, 1929. He gives a rather indefinite history of petit mal seizures during which his left arm would jerk slightly and he would feel confused for a few seconds. During the past year he had four or five of these attacks. Since the onset of his convulsions two years ago his headaches have been less frequent and less severe.

The physical and neurological examinations were negative throughout. The cranial nerves, fundi, reflexes, sensation, and so forth, were normal. Hemoglobin, 82 per cent; blood pressure, systolic 120, diastolic 70; urine, normal. His blood Wassermann was negative. The spinal fluid was clear, under normal pressure, contained 7 cells, a negative globulin, a negative Wassermann, and a negative colloidal gold curve.

He was placed on phenobarbital and his fluid intake restricted. Under this regime he had two slight headaches and one major convulsion during the following year.

Case 7.—Epilepsy diagnosed hysteria during early life.

Mrs. M. G., aged 33, married, was seen in consultation with Dr. F. E. Butler, Menomonie, Wisconsin, August 17, 1932.

The family history was negative. The personal history was negative except for mumps and measles in childhood; an appendectomy at 12. Her menstrual periods were normal. She had never been pregnant.

At the age of twenty-one she had an abscessed tooth which was lanced and drained for one week. She lost five pounds in weight. About three weeks later she developed her first attack. These have continued up to the present time and are gradually becoming more pronounced. They occur from four a month to one in two months. Four years ago she was free from attacks for six months. They bear no relation to her menstrual period. The attack begins with a tight sensation in her stomach. Associated with this she develops a feeling that whatever she is doing or wherever she is at the time of the attack she has experienced it previously. But even during the spell she realizes that this is not true. The attack is of about one-half minute duration, is not associated with unconsciousness but is followed by a short period of fatigue. During 1930 she passed through a period of mild depression of six months' duration. She consulted several physicians and was told that these attacks were entirely hysterical and to ignore them. In November, 1930, at the age of thirty-one, she developed her first grand mal attack with generalized convulsions and unconsciousness. These occurred about once a month, associated with her menstrual period, and were both diurnal and nocturnal. The physical and neurological examinations were negative throughout. All cranial nerves, fundi, reflexes, sensation, and so forth were normal. Hemoglobin 81 per cent; blood pressure, systolic 108, diastolic 78; urine, normal. Blood Wassermann was negative. A spinal fluid examination made September 10, 1932, revealed normal pressure, three cells, a negative Wassermann and negative colloidal gold curve.

The early attacks evidently were petit mal in type and continued so for ten years, until her first grand mal attack manifested itself in her thirtieth year.

Case 8.—Jacksonian epilepsy of undetermined etiology.

B. E., female, aged 35, single, a cook, was first seen April 8, 1932.

The family history was negative except that one brother died at the age of three in convulsions.

Her personal history was negative. She is right-handed. She denies venereal disease but admits exposure. Her first attack occurred eight years ago within one month of her first sexual experience. (This is mentioned because of the possible luetic factor and the positive spinal fluid.) This seizure began at the age of twenty-seven with a drawing sensation in her left eye, followed by a twitching of the left side of her face, and a peculiar chewing movement of her jaws of several minutes duration. She had four similar attacks during the next three months. About this time she had her first Jacksonian spell. This began with a cramp-like feeling in her left hand gradually extending up the arm to the shoulder. This was followed immediately by excruciating pain of the entire arm. She suddenly became unconscious. When she recovered she noticed that she had chewed her tongue. During the next three months she had six spells limited to the face only. During the next three years both types of spells occurred in severity and frequency. She had a series of eight severe attacks in ten days. The attack would begin in the left hand, involve the left arm, then the left face, and then the left leg, with or without unconsciousness. After the attack the left arm and leg would be numb and paralyzed for about fifteen minutes. In 1929 she had a large series of convulsions limited to the face, about 400 in nine days. Since that time there has been numbness of her left upper lip. For ten months following this she was entirely free from all attacks. During the past ten months she had a constant feeling in her left hand as if a spell were coming on. The most frequent type during this period has been the involvement of the left arm, face, and leg, with a subsequent motor weakness of one-half hour to ten hours duration. All attacks have been limited to the left side.

Fig. 1. Anterior posterior view of Case 8, Jacksonian epilepsy. Right lateral ventricle occluded; left lateral ventricle normal, but displaced slightly to the left.

She has been taking from 4 to 12 grains of luminal daily for several years with variable benefit.

In 1926 she was under the care of Dr. W. Long, Fargo, North Dakota, who found a four plus Wassermann, 28 cells, a positive globulin, and a luetic colloidal gold curve in the spinal fluid. Intensive antiluetic treatment intravenously and intraspinally gave no clinical improvement except a return to a normal spinal fluid.

In 1928 she was at the Mayo Clinic, where a diagnosis of a subcortical lesion, right motor area, was made. Her spinal fluid was normal at this time, but, on the basis of previous positive serology, antiluetic treatment was given.

She never had any headache, nausea, vomiting, or any other symptoms suggestive of intracranial pressure.

The physical examination made in April, 1932, was negative throughout. The neurological examination was negative except for a horizontal nystagmus bilaterally, a slight weakness of the left angle of the mouth, a slight increase of the tendon reflexes with some ataxia of the left arm and leg. There was no Babinski and sensation was normal throughout. While in the hospital she had several Jacksonian attacks, following which there was marked impairment of muscle strength of the left arm and leg with gradual return to normal. All laboratory findings, including the spinal fluid examination, were normal.

An encephalography made May 2, 1932 (see figure), showed that the right lateral ventricle could not be visualized, that the left lateral ventricle was of normal size and shape but displaced slightly to the left. Following the air injection she was entirely free from convulsions and without any medication for two months. After that time the attacks recurred as before.

A diagnosis of a subcortical lesion in the right motor area obstructing the right lateral ventricle was made. She was advised to return to the Mayo Clinic for a decompression operation, which she refused to do.

COMMENT

An incomplete classification of diseases in adult life associated with convulsions is given.

The necessity of thorough and repeated examinations is emphasized along with the importance of spinal fluid, blood, fundi, and other investigations in order to arrive at the correct etiologic factor.

Essential epilepsy and hysteria must be considered. Usually these can be excluded after exhaustive research and after further development of the underlying disease.

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CASE REPORTS

CALCIFICATION OF PERICARDIUM*

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In a recent review of the subject of calcification of the pericardium, Smith and Willius found ninety-four cases which came to necropsy reported in the literature up to 1924. To the thiry-four cases in which the condition had been recognized in the course of the life of the patient they added one case. Because of the relative rareness of this condition I wish to report the following case in which calcification of the pericardium was proved in life.

REPORT OF CASE

A married man, aged forty-eight years, came to the clinic in 1924 with the complaint that two months previously he had been seized suddenly with severe palpitation with a noticeable irregularity of the heart while walking up a steep grade to his home. The blood had seemed to rush to his head and to cause dizziness so that he held to the fence to keep from falling. From that time he had had palpitation on slightest exertion so that it was necessary for him to stop two or three times during his walk home. His family history was apparently negative, although seven of his brothers and sisters had died of acute infections during early life. His three children were healthy. At twenty-five years of age he had had mumps but except for this mild illness he had been in perfect health until the onset of palpitation.

Examination showed auricular fibrillation in a heart which was apparently normal otherwise. There was no evidence of decompensation. Cardiac regimen was instituted with some improvement in the condition of the patient.

In March, 1929, the patient returned stating that for the last month his abdomen had increased in size and he had some distress and bloating after meals. Dyspnea on exertion had increased. Examination showed the condition of the heart unchanged. The abdomen was filled with fluid and a large firm liver was felt. The urinalysis was negative. The hemoglobin was 85 per cent and the leukocytes numbered 9,700 in each cubic centimeter of blood. The differential count was normal. The Wassermann reaction of the blood was negative.

Abdominal paracentesis was done and a large amount of clear straw colored fluid was removed. After this abdominal paracentesis was done every one to two weeks for the next sixteen months. Salyrgan was given for a period of time but the response was not sufficient to give the patient relief so he asked that paracentesis be resorted to. During this time there was no apparent cardiac change and no edema of the legs.

August 16, 1930, the patient was in an automobile accident so he was admitted to the hospital. He suffered from a few bruises over the right side of the thorax posteriorly. Physical examination did not show him to be acutely ill. There was a mild icteric tinge to the sclera. Lungs contained a few râles at the base and the diaphragm was somewhat high. The heart was moderately dilated, totally irregular, with a soft systolic murmur which was heard best over the base. The pulmonic second sound was greater than the aortic second sound. The abdomen was greatly distended with fluid. The liver, which was palpated about 10 cm. below the right costal arch, was hard and not tender. Edema was present over the buttocks, sacrum and pretibial region.

Urinalysis showed a faint trace of albumin. Erythrocytes numbered 4,040,000, and leukocytes 8,900 in each cubic centimeter of blood; the differential count was normal. The Wassermann reaction of the blood was negative.

Roentgenologic examination of the thorax gave the diameter of the thorax as 34.5 cm. and that of the heart as 18 cm. (Fig. 1). A roentgenogram taken to

*From the Arrowhead Clinic, Duluth.

exclude fracture of the ribs showed a small area of calcification in the pericardium (Fig. 2). The electrocardiogram gave the cardiac rate as 84 with auricular fibrillation and there was evidence of a slight right ventricular preponderance. The T wave was inverted in all three leads. Basal metabolic rate was —23 per cent. A diagnosis of adhesive pericarditis and Pick's disease with cirrhosis of the liver was made.

During the patient's stay in the hospital abdominal paracentesis was done on five occasions; 4,000 c.c. of clear straw colored fluid being obtained each time. Digitalis and diuretics including salyrgan were given. He left the hospital in an improved condition thirty days after admission.

Following the patient's discharge from hospital abdominal paracentesis was performed every two to six weeks for the next two years. The interval was gradually shortened and for a month prior to readmission to the hospital paracentesis was necessary about every four to seven days. The condition of the heart, however, remained the same.

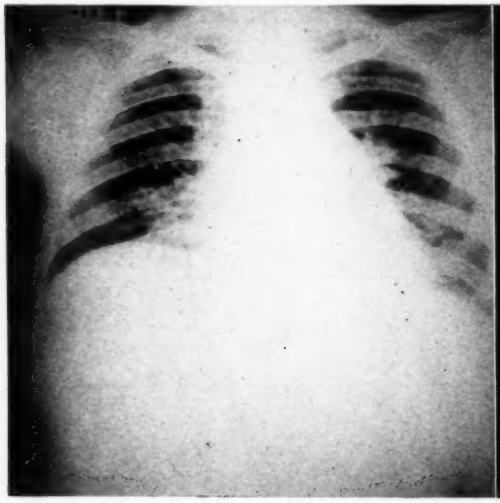

Fig. 1. Thorax in 1930. The heart is 18 cm. in width, the thorax, 34 cm. (6 foot plate).

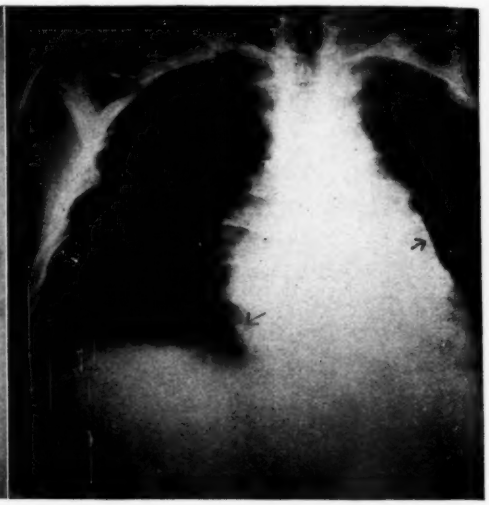

Fig. 2. Roentgenogram taken to eliminate fracture of the ribs in 1930. Arrows show areas of calcification in the pericardium.

Fig. 3. Extensive calcification of the pericardium in October, 1932.

On admission to the hospital October 4, 1932, the patient appeared very ill. He complained considerably of discomfort in the abdomen after eating and stated that for the last week his legs had been swollen and that he was troubled with an irritating nonproductive cough. His skin was dry and scaling. The sclera were moderately icteric. The blood pressure was 80 systolic and 48 diastolic in millimeters of mercury. The heart was totally irregular with an apical rate of 120, and was slightly enlarged to percussion. Marked intercostal retractions were noticed over the precordium and Broadbent's sign was present. No murmurs were heard. The lungs were clear. The abdomen was markedly distended with fluid and there was some lower abdominal tenderness. The legs were edematous and the edema was especially marked over the dorsum of the feet.

Urinalysis showed slight amount of albumin and an occasional red blood cell to the high power field. Erythrocytes numbered 4,180,000 and leukocytes 13,400 in each cubic millimeter of blood. The hemoglobin was 80 per cent. Examination of blood chemistry gave the urea as 19.6 mg. and the creatinine 1.5 mg. for each 100 c.c. of blood. The icterus index was 11.8. Electrocardiogram gave the cardiac rate as 124 with an auricular fibrillation. The T wave was iso-electric in lead I and inverted in leads II and III. There was occasional

extra systole. Roentgenograms of the heart disclosed an extensive calcification of the pericardium with only moderate enlargement of the heart (Fig. 3).

Treatment consisted of the use of diuretics, salyrgan and ammonium nitrate, from which splendid response was obtained. The fluid intake was limited to 1,000 c.c. in twenty-four hours. Digitalization brought the pulse rate down from 120 to 90. The auricular fibrillation persisted. Two weeks before death frank thick gelatinous pus was obtained at abdominal paracentesis. On three subsequent tappings the same material was obtained. In spite of this purulent peritonitis there was no fever or rise in pulse rate and the bowels moved satisfactorily. The patient failed slowly, refused to eat and died, twenty-four days after admission to the hospital and eight years after his first cardiac symptoms.

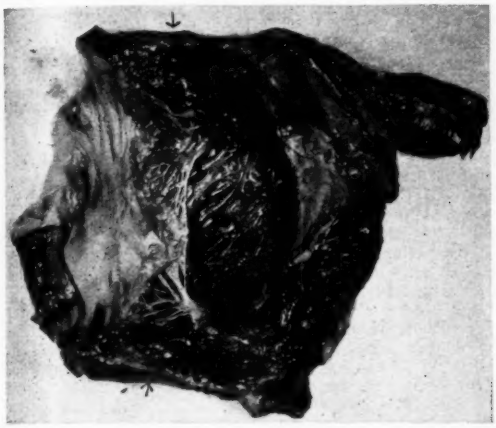

Fig. 4. Gross specimen of the heart showing the left ventricle and the mitral valve. The arrows indicate the calcified pericardium which has been cut through.

Fig. 5. Roentgenogram of necropsy specimen showing extensive calcification.

REPORT OF NECROPSY

The peritoneum was moderately thickened. The intestines and stomach were firmly adherent, covered with a gelatinous exudate and situated in the posterior part of the abdomen; the anterior part of the abdomen contained 1,500 c.c. of thick gelatinous purulent material. The spleen weighed 370 gm., and its capsule was markedly thickened and whitish in color. The liver weighed 1,870 gm. Its capsule was also markedly thickened with a hyaline-like perihepatitis (Sucre Cucka Leber). The parenchyma of the liver showed marked cirrhotic change.

The transverse pericardium measured 14.5 cm. There was almost complete obliteration of the pericardial sac with extensive calcification in the form of large irregular plaques which measured 0.7 cm. in thickness and as much as 9.0 cm. in width. On palpation the heart had the consistence of a macerated fetal head. The heart with pericardium weighed 600 cm. The myocardium appeared normal. The left and right ventricles measured 1.2 and 0.5 cm. in thickness respectively. The left and right auricles were moderately distended. The valves were competent and the aortic valve measured 7.1 cm. in circumference, the mitral 11.5 cm. and the tricuspid 15.5 cm. The foramen ovale was patent but competent. The coronary arteries were moderately dilated and there was no evidence of sclerosis. Figure 4 shows the gross specimen with the left ventricle open. Figure 5 is a postmortem roentgenogram which coincides well with that taken of the heart before death.

COMMENT

A case of calcified pericardium and Pick's disease with cirrhosis of the liver is reported. The relationship between these conditions is difficult to determine. As the calcification of the pericardium was only accidentally found while taking roentgenograms to show the ribs, such a procedure is probably wise in order to ascertain the presence of calcium in all cases of adherent pericardium.

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CHRONIC ANEMIA WITH SPLENOMEGALY AND GRANULOCYTOPENIA*

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In the medical literature of the past few years an increasing number of cases with marked diminution or absence of granulocytes in the circulating blood stream and a more or less characteristic syndrome have been reported. Most of the cases of the so-called acute agranulocytosis present little or no change in the

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red cell count, though some of the subacute and chronic cases may show some anemia. Hence, the reason for the report of the following case which exhibits a very interesting clinical history and a blood dyscrasia eventually terminating in a granulocytopenia.

REPORT OF CASE

The patient was a young married woman, aged thirty-two, who had been an invalid ever since the birth of her only child thirteen years before. At that time following a puerperal sepsis she developed a deforming ankylosing arthritis involving practically all her joints, now quiescent, but completely disabling her and making her bedridden. She had been anemic for years and for several years had had recurring attacks of severe upper abdominal pain lasting from a few hours to two weeks, accompanied by nausea and vomiting and often associated with or followed by a fever of varying duration.

She was first seen in September, 1929, in one of these attacks which had lasted for two days. The pain radiated to the right scapular region and up into the chest, somewhat characteristic of a gallbladder pain. Examination revealed an emaciated anemic young woman with contractures involving all the small and large joints of her extremities. The sclera and skin showed an icteric tint. Heart and lungs were normal. There was marked tenderness and rigidity in the right hypochrondrium and iliac fossa, and the spleen was enlarged to three fingers below the left costal margin. Pelvic examination was unsatisfactory on account of the deformities. Urine was normal; blood pressure 110/84; temperature 102° and pulse 124.

She was seen several times in 1929 and 1930 for similar attacks, sometimes with the pain more generally abdominal, and once for an attack of pyelocystitis. A blood count made in May, 1930, revealed a hemoglobin of 60 per cent, red cells 3,100,000, and leukocytes 5,850, with about 52 per cent polymorphonuclears. The spleen varied in size, at one time being only a finger's breadth below the costal margin.

The family history is somewhat interesting. Her father died of a marked anemia with possible gastric malignancy; her mother of influenza. Three sisters are living, two of whom have suffered at times from anemia. Her daughter was jaundiced the first two years of her life and was anemic until after the age of puberty.

On March 11, 1931, the patient became ill with a severe sore throat, chills, fever of 105 degrees, and marked weakness and prostration, which had been present for five days before she was seen. An ulcerating blister developed on the right hand. Her throat was fiery red, and several grayish patches were noted on the left tonsil and pillars. No Vincent's organisms were found. Blood count revealed hemoglobin 55 per cent, erythrocytes 2,550,000, and white blood cells 3,500, with neutrophiles 37 per cent, lymphocytes 46 per cent, monocytes 14 per cent, premyelocytes 2 per cent, and Turk's irritation forms 1 per cent.

The color index was 1 plus. The red blood cells showed considerable anisocytosis, with macrocytes and some microcytes, only moderate poikilocytosis, considerable polychromatophilia, and a very few nucleated red cells. Blood platelets were numerous. There was a definite increased fragility of the erythrocytes, hemolysis beginning at .50 and complete at .42. A blood culture was negative; Wassermann negative. Free HCl was present in the stomach contents. Urine was normal, aside from the constant presence of urobilin.

The throat gradually improved, but an acute pericarditis with moderate effusion and a fibrinous pleurisy (left chest) developed, causing such marked dyspnea that for two or three days her condition was critical. On April 5, the leukocyte count was 1,900, with only 19 per cent polymorphonuclears; lymphocytes 71.5 per cent; monocytes 8.5 per cent, and premyelocytes 1 per cent. However, by April 8 considerable improvement had occurred, with the disappearance of the pericarditis and pleurisy. The ulcer on the hand healed slowly. In spite of this, the hemoglobin was only 39 per cent on April 10, red blood cells 2,280,000, and white blood cells 2,100. By April 25, the hemoglobin had gone up to 46 per cent; red blood cells 2,490,000, and leukocytes 1,600, of which 26 per cent were neutrophiles. The spleen varied in size, the border once reaching the umbilicus.

On May 16, 1931, after the patient had gone home from the hospital, a typical trench mouth, with the presence of numerous Vincent's organisms, developed. Local treatment and a few intramuscular bismuth injections soon cleared this up.

She was seen during the summer and early fall several times for attacks of pain in the upper abdomen, some of them quite prolonged and severe. The spleen was much enlarged during some of these attacks. A fibrinous pleurisy on the right side was present on one occasion. On August 21 the leukocyte count was 2,400, with granulocytes 31 per cent, lymphocytes 64 per cent, and monocytes 5 per cent.

On December 2, she entered a Minneapolis hospital for observation. The findings were essentially the same, the white blood count ranging from 1,000 to 1,900, with only 4 per cent neutrophiles on one occasion. The icterus index was eight units, and the fragility of the erythrocytes was increased. Stool examination was negative. While there she ran an irregular fever as high as 103 degrees, and developed hematomata in the right ear and swelling and redness of the gums and upper lip.

In spite of her condition she insisted on going home December 25, 1931, and the mouth condition became gradually worse with the formation of grayish necrotic patches in the upper lip and upper jaw on the right, ulceration and necrosis developing to such an extent that the bone was involved and the roots of two teeth were exposed. No Vincent's organisms were found. However, by January 14, 1932, these ulcers had practically healed, when a severe glossitis developed on January 21, and later a deep necrotic area formed on the right cheek, opposite the lower molars. By February 19, the mouth again had almost healed, but on the 20th she became ill with a respiratory infection, either influenzal (as the other members of the family had been having influenza) or else terminal. She rapidly became worse and died on February 22, 1932. Due to some misunderstanding no notification of her death was received until the following day, so that no autopsy was obtained.

Blood examination made the day before death revealed a hemoglobin of 42 per cent, red blood cells 1,850,000, and leukocytes 750, of which there were 21 per cent granulocytes, all immature; 73 per cent lymphocytes, some abnormal, and 6 per cent monocytes.

COMMENT

The rather prolonged course in this case was probably partially due to the patient's indomitable will power. The exact nature and pathogenesis of the blood condition has been a matter of very interesting conjecture.

There is no doubt but that her hematopoietic system had been taxed to the limit by her continued infection and that the ability to produce granulocytes gradually failed in spite of the apparent clinical recovery from the mouth infection and some of the other intercurrent infections. For a year at least a chronic granulocytopenia was in evidence, but a true agranulocytosis never existed.

Although a malignant neutropenic state sometimes causes an enlarged spleen,[1,2] in our case the splenomegaly antedated by several years the beginning of the neutropenia. Hence, the constant splenomegaly associated with a marked anemia deserves special consideration.

A hemolytic jaundice was considered from the history of a constant slight icterus, a definite hemolytic anemia with slight increased fragility of the erythrocytes, the history of recurring attacks of abdominal pain resembling those of a cholecystitis or cholelithiasis (so often found in these cases), and the presence of anemia in the family. However, a recent fragility test on her daughter showed a normal response to hypotonic salt solution. The jaundice, too, was not as marked as that usually found in hemolytic icterus. The characteristic round microcytes were also less conspicuous than is usual in these cases. Of course, this does not rule out the existence of the acquired type of the disease.

That somewhat ill-defined group of cases known as splenic anemia should also be considered. However, the history is somewhat atypical, and there never was any hemorrhagic tendency, even before death.

At the Mayo Clinic a series of cases designated as chronic infectious splenomegaly[3,4,5] have been studied as distinct from splenic anemia, occurring after chronic infections, as arthritis, ulcerative colitis, endocarditis, etc., often secondary to a primary portal thrombophlebitis. Might not the case of this young woman come under this classification, her attacks of abdominal pain possibly arising from portal thrombophlebitis, which as a part of a long series of infections dating back to the puerperal sepsis and arthritis deformans, caused the splenomegaly with the coexistent hemolytic anemia and finally the hypogranulocytosis? An autopsy no doubt would have cleared up some of these questions.

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DIVERTICULUM OF THE GALLBLADDER

A. L. Pertl, B.S., M.D.
Windom, Minnesota

Mrs. R., a young married woman of thirty-two years, had always been well before her marriage in 1927. Her weight at that time was 140 pounds and showed a gradual increase up to 150 pounds during the three years following.

In 1929, the patient noticed distress after eating oranges but other foods gave no trouble.

During the patient's first pregnancy, which took place in August, 1930, she suffered much from nausea, vomiting and belching during the entire period of gestation. Seven days after delivery, in June, 1931, she suffered a severe attack of belching, nausea and pain throughout the entire right abdomen and extending through to the right scapular region. Similar attacks of variable duration and severity recurred following eating of fatty foods, pastry and meat, or extreme fatigue. In July, 1932, the patient complained of constipation and mentioned her inability to eat celery. At this time she was slightly jaundiced.

I was called to see the patient at 2:00 A. M. on November 2, 1932, because of another attack of severe abdominal pain extending through to the back on the right, with vomiting and nervousness. Temperature, pulse and respiration at this time were normal and the pain was relieved by hypodermic. I was told that the pain had been present for the past week and had been gradually getting worse. By afternoon of the same day the vomiting had persisted without change in the previous findings but a slight jaundice of the skin and sclera was noticed. The blood pressure was 120/60, the w.b.c. 9000. The patient was taken to the hospital at once and given 1000 c.c. of normal salt solution subcutaneously and four sodium amytal capsules per rectum. The following day the subcutaneous injection was repeated and three tablespoons of citrocarbonate of sodium and 500 c.c. of water were given every five hours. The following day 5 per cent glucose solution was administered subcutaneously and some 10 per cent of the same solution intravenously. Patient was able to leave the hospital on November 7 and improvement continued until November 17, when a similar attack recurred and the patient returned to the hospital for operation. Preceding the operation three sodium amytal capsules were given per rectum and two hours later 1 c.c. of pituitrin subcutaneously. This was followed by operation under ether anesthesia some twenty minutes later.

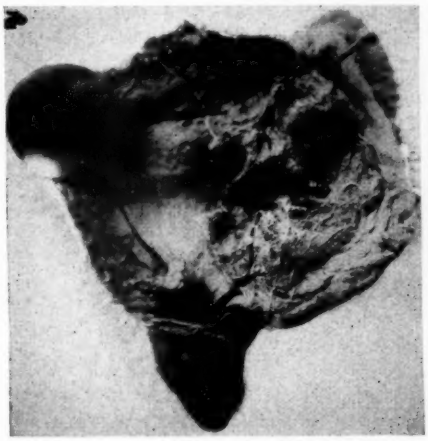

Fig. 1. Photograph of gallbladder with diverticulum. Actual size 2 × 1.5 inches.

An upper right rectus incision was made and upon opening the abdomen a few adhesions in the region of the gallbladder and liver were found. The tip of the gallbladder was adherent to the jejunum and, when freed, a diverticulum of the gallbladder was found to have perforated the wall of the bowel. The opening in the bowel was sutured at once and upon further inspection the gallbladder wall was found to be slightly thicker and more congested than normal. In the cystic duct was a stone ¾ inch in diameter which was milked back into the bladder before the duct was tied and the gallbladder removed. The appendix appeared to be subacutely inflamed and was,

(Continued on Page 218)

PRESIDENT'S LETTER

DEAR Fellow Members:

Last month I set up certain problems regarding the policy of the organized medical profession towards the care of the indigent. Many very interesting and valuable opinions were expressed for which I wish to thank the contributors and assure them that they are much appreciated.

This month I would like to obtain the reaction of the members of our organization on the following matter:

Do you consider that there are too many medical students going into specialties?

Do you think it would be better for our University Medical School to devote the facilities of the graduate school to retraining and keeping the man now in practice up to date in medical knowledge and skill rather than continuing the present plan of training specialists only?

Yours truly,

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

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Vol. XVI MARCH, 1933 No. 3

MORE ABOUT THE COST OF MEDICAL CARE

The final report of the Committee on the Costs of Medical Care was considered of sufficient importance to warrant the State Association's calling a meeting of the interested professions on December 18 last, to hear a presentation of various viewpoints by those who had given the subject much thought. Unfortunately, MINNESOTA MEDICINE cannot reproduce the entire afternoon and evening program, but five of the addresses appear in this number of the journal, for the enlightment of those who were unable to attend the meeting.

The large attendance at the meeting indicated the widespread interest of the profession in the report. If all who attended had read the complete report from cover to cover they would probably not have been in a more receptive mood to hear the speakers. The mass of material contained in the report is only too likely to lead to mental indigestion and the conflicting recommendations of the majority and minority reports result in mental chaos. The meeting brought out very few ideas that could be construed as constructive. Perhaps there is no more solution to the problem of providing adequate medical care for everyone than there is to providing adequate food, fuel and clothing for everyone. Certainly we have not solved the latter problem. Doubtless the same factors of human inequalities and weaknesses interfere with the attainment of both ideals. The same proposals of group action and insurance are being proposed for each problem. We have the examples of the functioning of these methods in certain European countries. The disadvantages seem to outweigh the advantages.

It is well, however, for the medical profession to give serious thought to the recommendations of the Committee on the Cost of Medical Care. We should try to crystallize our attitude towards the problem so as to know how to meet innovations which are likely to be proposed. The fundamental consideration which most physicians consider essential to the satisfactory working of medical insurance is the maintenance of the free choice of physician. This has been the stumbling block in most insurance schemes. The extension of group practice of medicine and insurance would be most detrimental to the general practitioner who, it is agreed, is the backbone of the present system of medical practice.

As a matter of fact there is no one system of medical practice which is practicable and ideal for every community. It will be necessary in all probability for each community to settle its own problems as they arise, and each local group of physicians is likely to be called upon to settle its own economic problems.

It is questionable whether the people of this country want a revolutionary change in the rendering of medical care such as has occurred in European countries. There is good reason to believe that the quality of medical services in Europe has suffered through the socialization of medicine, and an enormous burden has been placed on the taxpayers.

Important as proper medical care is, we venture the opinion that the public today is not suffering nearly as much from lack of necessary

medical care as from lack of food, fuel and clothing. The enormous increase in free medical service during the last three years is evidence of our willingness as a profession to meet the medical needs of the public whether they pay or not. If some genius would only come forward with some insurance scheme which would relieve the profession of their unequal share of this burden and still maintain free choice of physician, he would be a godsend to the profession and to the public at large.

CERTIFICATION OF SPECIALISTS

There is evidence of some growing agitation for the adoption of some method of certification of specialists. The question of the proper training and recognition of specialists has occupied the attention of the Council of the American Medical Association for some time. Certain steps have been taken in a few European countries and in Canada for the certification of specialists. One of our State Medical Associations (New Jersey) was forced to institute a plan to avoid legislative action.

Admittedly the status of specialization in medical practice has been rather a hodge-podge. For the most part each individual's claims have been the main criteria of classification. Membership in local and national societies of specialists has resulted in recognition of special ability and interests, at least among one's confrères, and these societies have added some dignity and order to the specialties.

Just how much practical advantage to the public national or state certification of specialists would be, is a question. People in general are not inclined to be very discriminating and official recognition of ability is perhaps too often ignored. The specialist as well as the general practitioner increases his clientele for the most part as a result of his work, which is as it should be. The too narrow restriction of specialists by legislation is certainly not desirable. This phase of the bills which were recently proposed in the New Jersey legislature is said to have been the cause of their defeat.

The question is likely to arise whether we in Minnesota should make plans for the certification of specialists by our State Association, following in the footsteps of New Jersey, or await attempts at legislative control. If anything is done, it should be done by physicians and not by the legislature. The State Association could easily add a committee to its organization to act in conjunction with county committees. The issuance of certificates and even the publication of lists of certified specialists need not interfere with any individual's method of practice. The uncertified practitioner could still legally care for illnesses which he feels himself qualified to treat, but the certification of those with special training and experience would enable the discriminating layman to pick and choose a little more intelligently.

We can see some objections to the proposal. Bickering and personal animosities might arise. On the other hand, there are some good reasons for specialization and the certification of specialists, and the profession is the proper agency to do the certifying.

OVERSUPPLY OF NURSES

The nursing profession is confronted with the same problem of oversupply as the medical profession. During the next few years the problem is likely to become even more acute. The supply of nurses has been increasing at a much greater rate than the demand and it seems likely that it will take some years before a proper adjustment can be effected.

A survey of the situation in Minnesota was recently made by a committee of the Minnesota State Registered Nurses' Association and was published in the official journal of the association in December. The increase in the number of registrations since 1920 resembles the soaring of the stock market in pre-depression days.

The present Act relating to the practice of nursing was passed in 1907. Nurses meeting certain requirements were registered under a waiver until 1910. By 1920, 2,948 nurses had been registered; during the next ten years, 6,452. From January 1, 1930, to August 11, 1932, 2,639 additional nurses received registration certificates. With some 3,000 nurses in training at present it can be readily seen that the present oversupply of nurses will be aggravated rather than lessened in the next three years.

We have no figures available as to the number of nurses who have deserted the active ranks for other fields. We are informed, however, that there have been in certain districts in the state some fifteen nurses remaining on call to every nurse called for private duty since January 1, 1932.

There is some evidence that the training of nurses is being curtailed. Some training schools have been discontinued, some have temporarily suspended the enrollment of new classes, and in some hospitals the classes are noticeably smaller. It does seem as though concerted efforts should be made by those in charge of the nursing schools to curtail the supply in the interest of the present nursing personnel as well as those contempating entering training.

The proposed bill before the legislature for another waiver of qualifications for registration of nurses is unjust to the nursing profession. Such a step would lower the standards of the profession in the state and would cheapen the value of the R.N. degree. The nursing profession is in a position to increase the requirements in selecting candidates and thus raise rather than lower its standards. It is inconceivable that the proposed waiver will receive serious consideration.

OF GENERAL INTEREST

Dr. J. J. Swendson addressed the Washington County Medical Society at Stillwater, Minnesota, February 14, 1933, on the subject "Obstetrical Anesthesia and X-ray Pelvimetry."

Dr. A. E. Wilcox has been elected president of the staff of Abbott Hospital, Minneapolis. Other officers are: Dr. F. H. K. Schaaf, vice president; Dr. George Eitel, secretary. Members of the staff executive committee are: Dr. O. S. Wyatt, Dr. R. A. Johnson, Dr. K. Phelps; Dr. Ray Swanson, and Dr. Cecile Moriarity.

Hospital operating costs and other financial problems will be the principal topics of discussion before the delegates to the 1933 convention of the Minnesota Hospital Association, which will be held at the Curtis Hotel, Minneapolis, May 25 and 26.

Dr. O. J. Seifert, New Ulm, talked on "Spinal Anesthesia," showing four reels of moving pictures on the subject Technic of Spinal Anesthesia at the regular joint meeting of the Redwood-Brown County Medical Society and the staff of Union Hospital at the hospital in New Ulm, January 3, 1933. Eighteen physicians and six nurses from the hospital attended.

TRUDEAU SOCIETY RESOLUTION

The following resolution, unanimously passed by the Trudeau Society, has been received:

The Trudeau Medical Society, devoted to the study and prevention of tuberculosis, has, through a special committee, just concluded a careful study of the question of the case reporting of this disease.

According to the National Tuberculosis Association, Minnesota has the highest ratio of reported cases to deaths in the country. Last year, 3,424 new cases were reported. The ratio of cases reported to deaths was 3.22. There were 1,063 deaths. And the death rate per 100,000 was 41.1.

The morbidity rate ranges all the way from .97 in one section of the state to 2.77 in another.

The above figures show that there is a great variability in the ratio in different parts of the state. They also show that there are a considerable number of tuberculosis cases that are not reported until death.

Although this study would indicate that Minnesota ranks well to the front in the ratio of reported cases to deaths, we are still a long way from an ideal which seems reasonably possible of attainment.

Therefore, be it resolved by the Trudeau Society in the interest of improved reporting of tuberculosis in Minnesota, that the attention of the various interested groups be called to these facts, with the hope that still more interest may be shown and studies be undertaken to determine, if possible, the reasons why so many cases of tuberculosis are only reported by death certificates and also why there is such marked variability in the percentage of cases reported before death in various parts of the state.

Be it resolved that a copy of this resolution be sent to the Minnesota State Medical Association, Minnesota State Board of Health and the Minnesota Public Health Association.

Signed: C. B. WRIGHT, M.D., *Chairman*
E. A. MEYERDING, M.D., *Secretary*

MEDICAL CARE OF INDIGENT

In spite of discussions during the past four or five years, with reports of successful workings in other States, and with offers of data and assistance from your Committee on State Health Relations, only a very few local Minnesota medical societies have made any collective agreements with County Commissioners for better handling of medical care of the poor.

All of the five agreements in Minnesota, of which the Committee has information, are on the basis of the local minimum fee schedule with a percentage discount. They seem to be working satisfactorily. No Minnesota community or county has thus far established the so-called lump sum plan, though that plan elsewhere has apparently worked in practice with greater satisfaction to all concerned. Negotiations for establishment of such a plan are now going on in Duluth, and will, we hope, be successful. In two other counties the physicians have been discussing plans with the commissioners but have thus far been unable to convince them of its merits. In still other localities the physicians have been unable to negotiate because of lack of unity among themselves.

On the basis of the data at hand, it seems clear that the present system of care of the indigent by physicians appointed on competitive bids, even though apparently economical for the taxpayer, is an odious system. It leads to continual friction and is not satisfactory to commissions, physicians, or patients. Where a collective agreement has been made, the physicians and the authorities have been better satisfied, and, above all, the poor have received better medical care.

Your committee feels that the problem is very important and that it should have the earnest and effective attention of the members of all the local medical societies in Minnesota in order that a satisfactory solution may not be unnecessarily delayed.

COMMITTEE ON STATE HEALTH RELATIONS,
T. H. SWEETSER, M.D., Chairman.

OBITUARY

Theodore N. Kittleson

Dr. Theodore N. Kittleson, Fergus Falls, died of pneumonia complicating influenza on January 10, 1933.

Dr. Kittleson was born in Worth County, Iowa, March 21, 1875. A. few years later his parents moved to Canby, Minnesota, and he there attended the public schools. After a two years' business course at Decorah, Iowa, Dr. Kittleson took his medical course at the University of Minnesota and became associated with Drs. Cole and Drought at Fergus Falls. Following postgraduate study at Vienna and London Dr. Kittleson specialized in eye, ear, nose and throat diseases. Further studies were pursued in New York, Saint Louis and New Orelans.

In 1907 Dr. Kittleson married Miss Esther Munson Cole, an adopted daughter of Dr. and Mrs. A. B. Cole. Mrs. Kittleson died in 1913.

Dr. Kittleson was ever a lover of the great outdoors, and took pleasure in hunting and fishing. He was also an extensive traveler, several years ago having made a trip around the world. Enjoying an extensive practice, his charitable work was extensive, although known only to his intimate friends.

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

WORKMEN'S COMPENSATION OR UNEMPLOYED INSURANCE: WHICH?

Some eighty-five secretaries, officers, committeemen, and out-of-state visitors attended the 1933 Secretaries' Conference, a conference of special importance because of the pressing problems before the medical profession this year.

In a day given over to discussions of medical care for the poor, malpractice insurance, administrative problems, one of the outstanding sessions concerned itself with Workmen's Compensation Insurance. Speaking for this session were A. N. Collins, Duluth, Committee on Industrial Practice; J. M. Sweitzer, Saint Paul, Claims Manager, Employers' Mutual Liability Insurance Company; Niels Debel, Saint Paul, State Industrial Commissioner; J. M. Hayes, Minneapolis, Councilor, Sixth District; the Hon. Harry H. Peterson, Attorney General of Minnesota; and R. G. Leland, Chicago, Director of the Bureau of Medical Economics, American Medical Association.

All agreed that coöperative action on the part of the medical profession and the insurance companies is essential. Failing such coöperation, government insurance for injured workmen with all of its sequelæ looms in the distance.

Some interesting quotations from some of the speakers, indicating varying opinions, follow:

MR. DEBEL: We have the doctors to thank for the present efficiency and high standards of our administration of workmen's compensation laws.

ATTORNEY GENERAL PETERSON: I suggest that you physicians try to amend the present law so that when an injured employee sues his employer for damages, the employer be empowered to pay physician and hospital fees direct.

DR. COLLINS: Experience in New York City has shown us that our problems will best be solved by a working understanding with insurance companies.

MR. SWEITZER: You men will readily understand that the injured employee cannot well be allowed to choose his own physician. If he were so allowed, he might choose a quack or a faker, and his employer—or the insurance company—who paid the bill would be powerless to stop it. Naturally, the man who pays the bill wants to have some voice in the choice of the doctor to whom he pays it. In addition it is necessary to pick a man close to the plant where the employee is hurt.

DR. HAYES: It is fundamental to good medical care that we should insist at all times and in all our dealing with the public in any relation upon the right of the patient to choose his own physician regardless of who pays the bill or where his physician may be. The injured employee has that right in Minnesota according to good legal opinion based on a Supreme Court decision of two years ago.

In this we cannot yield to representatives of the insurance company in spite of the fact that, following a recent meeting in Minneapolis, we have a much better appreciation of the real problems faced by the insurance companies. Obviously for our own good and theirs we must get together with them as they have in New York. There, we understand, differences have been satisfactorily ironed out and things are going smoothly to the satisfaction of both the insurance carriers and the doctors.

DR. LELAND: It has been charged by the insurance companies, as an argument against right of choice of physician by the patient, that the doctor chosen by the patient is a partisan of the patient.

That charge is justified. The patient's doctor is and should be a partisan of the patient. What does the patient feel when he senses, as he surely must do, that an appointed physician is the partisan of the insurance companies or employer rather than of himself?

When you destroy the confidence of the patient in the physician you halt recovery and impair the readiness of the patient to supply essential facts relevant to the situation.

It is important that insurance carriers understand these things and also that we understand the problems of the insurance carriers. If we do not effectively get together, it is certain that government insurance will step in.

Suppose we take the load off workmen's compensation insurance and put it upon unemployed insurance? The authors of unemployment insurance will be sure to follow with the proposition: why shouldn't we take care of the health, also, of the unemployed? In a short time health insurance will take its place beside unemployment insurance. If it is adopted in all states we shall have an insurance system in America that passes any system now in existence in Europe.

At the present time there is only one state compensation body in the whole United States which has on it medical representation. We must attempt to be adequately represented on all such bodies. In every state society there should be an active committee on industrial practice, a committee that is in constant close contact with the state industrial commission.

We must coöperate with the insurance carriers, present to them our problems and make an honest attempt to see theirs. No doubt, we should have tried to work with the insurance companies before this. We cannot mend the past, but we can take steps to safeguard the future. If we start with the belief that all of us, including the insurance companies, want to be honest, we shall not fail.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

SPEAKER: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of March will be as follows:

March 1—Hypertension.
March 8—Cause of Burns.
March 15—Difference in Health Problems of Men and Women.
March 22—First Aid in Sprains and Fractures.
March 29—Tumors of the Breast.

AMERICAN UROLOGIC ASSOCIATION

The thirteenth annual meeting of the American Urologic Association will be held in Chicago June 20, 21 and 22, 1933, the week following the American Medical Association meeting in Milwaukee.

A large attendance and a fine scientific program are predicted, dry clinics from the wealth of material available at this cosmopolitan center to be furnished by Chicago urologists.

Applications for places on the program will be received by the Secretary, Dr. Gilbert J. Thomas, 1009 Nicollet Avenue, Minneapolis, until April 20, 1933.

Nominations for membership must be in the hands of the Secretary sixty days before the meeting.

MINNESOTA RADIOLOGICAL SOCIETY

The Winter meeting of the Minnesota Radiological Society was held at the Nicollet Hotel in Minneapolis, on Saturday, February 18, 1933, at 2:00 P. M. The following program was presented.

1. Pre-operative Diagnosis of Malignancy of the Liver with Thorotrast.
   LESTER G. ERICKSEN, M.D., Minneapolis.
2. The Physical Basis of Chest Radiography (Work of R. G. WILSEY) and the RUGGLES Cine-Cardiographic Film.
   ROBERT G. MORRISON, Minneapolis.
3. A Simplified Technic for Roentgenography of the Optic Canals.
   JOHN D. CAMP, M.D., and CESARE GIANTURCO, M.D., Rochester.
4. Atypical Findings in Bone Lesions.
   CHARLES G. SUTHERLAND, M.D., Rochester.
5. Roentgenologic Study of Bone Changes Accompanying Neurofibroma of the Spinal Cord and Associated Nerves. JOHN D. CAMP, M.D., Rochester. Discussion by W. A. O'BRIEN, M.D., Minneapolis.
6. Case Reports from the University Hospital.
   A. Demonstration of Methylene Blue Method for Calibrating Roentgen Ray Dosage. W. K. STENSTROM, PH.D.
   B. Achondroplasia Advanced Ossification, Vertebral Osteochondritis. JOHN B. ENEBOE, M.D.
   C. Carcinoma of Breast, Skeletal Metastases, Response to Radiation.
      C. O. HANSEN, M.D.
   D. Carcinoma of the Skin, Response to Radiation.
      FREDERICK B. EXNER, M.D.
   E. Simulants of Mediastinal Masses.
      LEO. G. RIGLER, M.D.

The Society was honored by the presence of DEAN RICHARD E. SCAMMON of the University of Minnesota Medical School, who delivered a very illuminating and stimulating address on "The Contributions of Radiology to the Study of Growth."

At the business meeting a resolution was adopted endorsing the principles of the Code of Ethics of the Philadelphia Roentgen Ray Society.

The next meeting of the Society will be held in Rochester, Minn., May 22, 1933.

LEO G. RIGLER, M.D., *Secretary.*

MAYO FOUNDATION LECTURES AND DEMONSTRATIONS IN MEDICINE

March 13 to 17, 1933

March 13 to 17, inclusive, a series of lectures and demonstrations in medicine will be given by the Faculty of The Mayo Foundation, Rochester, Minnesota. While these lectures are primarily for fellows of the Foundation, visiting physicians will be welcomed. The program will be largely in the form of clinics, patients being presented with discussion of the medical, surgical and pathological features of the cases. The morning sessions will start at 10:00 o'clock, the afternoon sessions at 2:00 o'clock and the evening sessions at 7:30 o'clock. The subjects to be presented are as follows:

Monday: Allergy; Diseases of the Upper Respiratory Tract; Bronchoscopy. *Tuesday:* Diseases of the Blood Vessels; Cardiology; Nephritis, and Hypertension. *Wednesday:* Diseases of the Biliary Tract; Constituents of Bile as an Index of Liver Function; Physiology of the Liver. *Thursday:* Diseases of the Colon; Neurology; Dermatology and Syphilis. *Friday:* Diseases of the Ear, Nose and Throat; Laryngology; Oral and Plastic Surgery; Ophthalmology.

BLUE EARTH COUNTY SOCIETY

At a regular meeting of the Blue Earth County Medical Society held at Mankato, Minnesota, the following officers were elected: President, Dr. H. L. Huffington; vice president, Dr. W. I. Howard; secretary and treasurer, Dr. R. G. Hassett; censor, Dr. E. W. Benham; delegate, Dr. A. G. Liedloff.

MOWER COUNTY SOCIETY

At the annual meeting of the Mower County Medical Society, held recently at Austin, Minn., Dr. J. G. W. Havens was elected president to take the place of Dr. P. A. Lommen, and Dr. W. B. Grise was elected vice-president. Dr. P. A. Robertson, Austin, and Dr. A. E. Henslin, LeRoy, were re-elected secretary and treasurer respectively. Dr. C. C. Allen read a paper on "Intracranial Birth Injuries."

At a preceding meeting, Dr. M. S. Henderson, Rochester, Minn., retiring president of the Minnesota State Medical Association, talked to the members on state association matters and then addressed the society on the subject of "Fractures of the Ankle Joint."

UPPER MISSISSIPPI MEDICAL ASSOCIATION

The Upper Mississippi Medical Association has chosen Dr. S. S. Shannon of Crosby, president; Dr. J. A. Thabes of Brainerd, vice president; Dr. G. I. Badeau of Brainerd, secretary-treasurer, and Dr. J. A. Thabes, Sr., censor. Mrs. S. S. Shannon was elected second vice president of the Ladies' auxiliary of the medical association.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD DECEMBER 1, 1932

The President, Dr. Kenneth Bulkley, in the Chair

REPORT OF THE MEETING OF THE INTERNATIONAL MEDICAL ASSEMBLY

Held at Indianapolis, Oct. 24-28, 1932

Dr. E. K. Green said he did not wish to take time from the able speaker from Rochester so he would give only a few points on the program of the International Medical Assembly meeting which had impressed him as important.

First, he was struck with the opposite views held by men of high standing in the profession on the subject of pelvic infections and disorders. Dr. Otto Schwartz took the stand that inflammatory pelvic conditions should be treated conservatively with rest and local heat and positively "hands off." Even thorough examination and office treatment many times aggravates the trouble and makes the patient worse. If surgery is indicated at all it should be after the infection is completely subsided and then it should be radical with hysterectomy. On the other hand, Dr. John R. Fraser, of Montreal, took the stand that curetting the uterus with a dull curette did no harm and intrauterine treatment with mercurochrome and antiseptics repeated during the illness was the best procedure. Both gave statistics to prove their method to be the best.

Dr. Frank Lahey, of Boston, gave a report of his work on 12,000 cases of hyperthyroidism operated in their clinic with a mortality rate of ½ per cent. Dr. Green said he wished to mention one thing in this report which seemed to him to be most important and that is Dr. Lahey's method of determining how much surgery to do in any given case, and Dr. Green said he had gathered the same idea when he visited Lahey's clinic in Boston a year ago. On his first examination he decides how much surgery to do, namely, ligation, lobectomy or thyroidectomy, and he seldom changes his mind no matter how much improvement the patient makes prior to the operation. He has three main points of determination: (1) loss of weight; (2) pulse rate; (3) age.

Dr. Irvin Abel, of Louisville, Ky., gave a clinic and a paper going into the subject of diverticulosis and diverticulitis. He said the condition nowadays was frequently discovered in the routine X-ray examination and that the treatment was medical except when a diverticulosis was converted into a diverticulitis. Then there was no stereotyped procedure. Resection, drainage, or whatever the surgeon found best to do, was the proper treatment.

Dr. Dean Bevan, of Chicago, gave a clinic on gallbladder disease. He took the stand very definitely that gall stones per se were not an indication for cholecystectomy or drainage. The only reason for removal was when they were giving the patient trouble.

Dr. Dean D. Lewis, of Johns Hopkins, gave a very good clinic on osteomyelitis. He made a plea for conservatism in the treatment of acute osteomyelitis. He said that practically 100 per cent of these cases were not diagnosed until after most of the damage had been done to the bone and any chiseling or operation on the bone did much more damage than it did good. Just opening the periosteum was the best procedure. He says we hate to admit it, but when it comes to selectivity in chronic osteomyelitis, and the determination of what tissue should be removed and what not, the maggot seems to have much more intelligence than the surgeon, so give the maggot a chance.

Dr. John J. Moorhead, of Columbia University, gave a clinic and paper on traumatic surgery and fractures that was full of meat. One thing he stressed very definitely, which Dr. Green thought had not been fully appreciated, was what he called the "golden hour" in the treatment of fractures, and this was within the first six hours. If a case goes past that time the difficulties are more than doubled and end-results many times are jeopardized. For open wounds, soap and water, débridement, and placing the sutures and packing the wound is many times the best procedure. On the third day, with the first change of dressings, the sutures are tied.

The enlarged prostate came in for its share of attention on the program. The intraurethral method of operation occupied most of the discussion. Hugh Cabot, of Rochester, spoke very favorably of that method and said they were getting some very satisfactory results. Dr. Joseph McCarthy, of New York, however, said that possibly they were too enthusiastic. He said one must remember it is rather early yet to decide, and that so far the procedure is largely post-graduate work and experimentation on the part of urologists, and it might be well for most of the surgeons to wait until it was a little more standardized.

Dr. George Crile had his usual clinic to show the association of the three conditions about which he has had so much to say lately, namely, hyperthyroidism, peptic ulcer, and neurocirculatory asthenia. He has now operated 204 cases by denervation of the adrenals with a mortality rate of about 6 per cent. He reported one case of a doctor who had had several stomach operations with no relief. Denervation of one side six months ago had so completely relieved him of symptoms that he thought the second operation would hardly be necessary. Dr. Crile showed two cases, one a school superintendent and the other a civil engineer, who were both invalids and not working because of neurocirculatory asthenia. Both men were denervated and at present, after several months, both were working and looked to be perfectly well and enjoying good health.

ANESTHESIA

Dr. J. S. Lundy of Rochester (by invitation) gave a talk on the above subject, dealing especially with (1) sacral anesthesia, (2) spinal anesthesia (including a discussion of ephedrin in stimulating the circulation), and (3) intratracheal anesthesia, the latter being much used in plastic operations about the face where one wishes to get the anesthetist out of the way; it is also highly desirable for operations on the lung. One of the greatest benefits of intratracheal anesthesia is in cases in which general anesthesia by inhalation is not being taken well; the air-way is not free and the tongue is usually the organ in the way. Motion pictures were shown demonstrating methods of administering these three forms of anesthesia.

DISCUSSION

Dr. S. R. Maxeiner stated he was sure all those present had enjoyed Dr. Lundy's talk this evening. He said he had had the pleasure of observing Dr. Lundy administer one of his intratracheal anesthetics not long ago in a case in which the anesthetic was a very grave problem. There were a number of consultants on this particular case. Spinal anesthesia was considered and discarded as unsafe. Local anesthesia was considered as a possibility but the patient was particularly uncooperative. This patient would not stand any morphin or sedative without paralysis of respiration, but with the tracheal tube in place and the controllable pressure within the gas bag, the administration of the anesthetic was absolutely under control and this patient passed through a smooth, uneventful anesthesia. Dr. Maxeiner felt that in this particular instance the method had proved itself and that Dr. Lundy was to be con-

gratulated particularly on that case. Dr. Maxeiner felt that Dr. Lundy's discussion of spinal anesthesia is particularly timely. As he visited various clinics, there seemed to him to be no standardization of technic; one uses one drug and the next another drug; some use ephedrin and some do not. He believes that there must be some safe standardized procedure acceptable to the general surgeon that would add to the safety of the patient and do away with the necessity of the experimental stages for the beginner.

Dr. Maxeiner said that at Fort Snelling they had done between 1,500 and 2,000 with spinal and in that number only one death could be in any way attributed to the effect of the spinal anesthetic. That patient was uremic due to infected bilateral cystic kidneys and was possibly not a good case for this method, although the risk would have been grave under any anesthesia.

Dr. Maxeiner said he was particularly interested in caudal anesthesia, which method they had used for many years. When he was with the late Dr. Farr, they had done some work on fresh cadavers before rigor mortis had appeared by injecting the caudal canal with sodium bromide solution. The height of the injection was observed by the X-ray when different amounts of solution were used. The same results had been observed by others with the injection of methylene blue into the caudal canal. The solution, when put under pressure, will follow the line of cleavage clear up into the neck. Dr. Maxeiner had observed anesthesia as high as the nipples in one patient injected with 120 c.c. of 1 per cent novocain solution directly into the sacral canal. He and Dr. Farr had performed parasacral anesthesia, as advocated by Dr. Lundy, but had not found it superior to the injections into the caudal canal alone. He believed the simpler the method, the more universal would be its use. Dr. Farr had always tried to simplify his methods so that they could be applied by the general surgeon as well as by a local anesthesia specialist. They had standardized their technic so that they limited themselves to 30 to 35 c.c. of 2 per cent novocain solution injected through the caudal canal very slowly, and aspirating at the end of every two or three c.c. in order to avoid the grave danger of injecting intrathecally or into one of the veins in the sacral canal. Any change of respiration, pulse rate or blood pressure usually means that the solution is being injected too rapidly, under too great pressure, or that the patient is absorbing it too rapidly.

Dr. Lundy said that the intratracheal method has been introduced for operations on the upper part of the abdomen in which spinal anesthesia was formerly used. The tendency now is to leave spinal anesthesia for the lower abdominal operations and use the intratracheal method for the higher abdominal operations.

It really is not difficult to do a sacral block, since there are three important landmarks: the posterior median line, the posterior superior spine, and the coccyx. Dr. Lundy said he had taught a number of Fellows, and they will ignore these landmarks until they are impressed with their value. The posterior superior spine is the most important.

Dr. Ralph Knight said this paper had been a real treat to him, and he knew it was to every one present. He said he was especially interested in Dr. Lundy's standardization of the dosage in spinal anesthesia, for he believed there was nothing that has had expressed about it so many differences in theory and practice involved as has spinal anesthesia. Dr. Lundy graduated this according to the weight of the patient, and Dr. Knight felt that most men had not given this enough consideration. It deserves more thought. Dr. Knight cited the work of Mr. W. Howard Jones, Charing Cross Hospital, London, who recently has brought out something which should give one pause, *i.e.*, he believes that very high spinal anesthesias are really not so much spinal as general anesthesia; so much of the novocain is absorbed from the spinal canal, that when there is respiratory failure it is because of the action of novocain on the respiratory center through the circulation rather than up the spinal canal. Mr. Jones has worked out a table of dosage based on the length of the spinal canal. Dr. Knight felt that Dr. Lundy's method of grading the dosage should be followed, and perhaps work into it the factor of the length of the canal as well. He thought most men feel that spinal should not be used for work above the diaphragm. Dr. Lundy has shown by slides and pictures how easy it is to pass an intratracheal tube; but Dr. Knight said that any one who had tried it must feel that it is not so easy as it is for Dr. Lundy.

Dr. Lundy said that MaGill maintains that he can pass an intratracheal tube about eight times out of ten without using a laryngoscope.

Dr. J. A. Heidbrink (by invitation) in discussing the Lundy-Heidbrink respirator, said he did not know that he could add much to Dr. Lundy's description and illustration of the apparatus. He had simply made it according to Dr. Lundy's instructions as to what he wanted it to do. There is a blower operated by a motor. It blows at one end and there is a suction at the other end; then there are valves that are operated by a motor that alternately connect the pressure and suction end of the blower to the patient. The respiration rate is controlled by setting the rheostat which controls the speed of the motor that operates the valves. There are also some safety valves which Dr. Lundy did not mention. On the pressure side there is a valve to limit the pressure into the lung at any desired level and there is also a safety valve on the suction side limiting the amount of suction which can be put on the lung. The operation of the machine has been illustrated in the moving pictures, and Dr. Heidbrink felt that was pretty well understood after seing these films. He said Dr. Lundy had very kindly invited him to see some of the experiments done on animals. It had resuscitated dogs after they had been paralyzed with spinal anesthesia and the dogs lived on for a long time afterward. He had also seen the machine operated on the human subject. Dr. Heidbrink added that it always gave him great pleasure to try and work out something of that kind when some one has a definite idea of what he wants to accomplish with a certain machine.

Dr. J. F. Corbett asked the size of the intratracheal tube.

Dr. Lundy replied that its maximal outside diameter is 1.3 cm. (about one-half inch) and that smaller sizes are used.

Dr. R. R. Cranmer asked Dr. Lundy for his opinion on the use of ephedrin in connection with the sudden drop in blood pressure and whether the injection of ephedrin 10 minutes or so before the spinal injection was the proper method, or if it should be given just before.

Dr. Lundy said he thought it a very good plan to give ephedrin some time before the spinal anesthetic is given if the patient has hypotension, but if the patient has hypertension one does not give it until after the procaine is deposited in the spinal fluid. So far as giving ephedrin is concerned, if the blood pressure falls to a low point and it is then given hypodermically or intramuscularly it will not be very effective; but if it is given intravenously it will act quickly. Dr. Lundy said that Harrison and Burch have written that if one wants to get the greatest effect from ephedrin it should be given intraspinally. Dr. Lundy has not been obliged to adopt this method. Dr. Lundy said he knew that pituitrin given intraspinally will raise the blood pressure so that there is danger the patient may die.

Dr. Theodore Sweetser said that, in his experience in prostatectomy, the cases done with spinal anesthesia tended to bleed more than those done with caudal anesthesia, and asked whether that had been Dr. Lundy's experience. He added he would like to see the lantern slides which Dr. Lundy had mentioned as showing the

effect on the spinal cord; that one of the neurologists here had called attention to various nerve disturbances occurring a considerable time after operations performed under spinal anesthesia.

Dr. Lundy expressed the belief that there is a tendency for the patient to bleed more after spinal than after sacral block.

Dr. A. T. Mann asked Dr. Lundy if, when the heart stops, there is any better means than adrenalin to start it.

Dr. Lundy replied that the best and most effective way to restore activity of the heart is by massage through the diaphragm after incision has been made. If this is impossible in a given case, then epinephrin may be injected, the injection following aspiration of a little heart's blood; one should not be in such a hurry that aspiration is not performed. If one can ventilate the patient's lungs and keep them ventilated, then some effect from the work on the heart is possible, but if artificial respiration is stopped while one tries to get the heart started, failure may result.

Dr. Leo Murphy asked about the postoperative course following spinal anesthesia; as to whether it had been found superior to other forms of anesthesia from the standpoint of the patient.

Dr. Lundy said that at least 5 per cent of patients have headache after spinal anesthesia, but that 10 per cent have headache after diagnostic lumbar puncture.

One thing Dr. Lundy said he must mention especially and that is foot-drop. He had had two or three cases in which foot-drop had appeared, but it had disappeared after a time. These effects came after spinal anesthesia. Dr. Lundy also had two cases in which foot-drop came on after sacral anesthesia and three in which it came on after general anesthesia; so he did not feel that the spinal anesthesia caused the foot-drop. He was satisfied, after the report of Johnson, that no person at all well during sleep lies in the same position more than seven or eight minutes at a time. The person takes one of several positions. There must be some reason why people change posture so frequently while asleep. But a patient who is strapped to a table for a time has no chance to change position. Dr. Lundy said he had also seen semipermanent paralysis after sacral block because the patient had a spinal cord tumor. In this case the patient, a woman, had paralysis for nine months, and then a spinal cord tumor about as large as the little finger was removed. Dr. Lundy said he had never seen a proved case of bilateral paralysis that was entirely due to spinal anesthesia.

The meeting adjourned.

F. A. Olson, M.D.,
Secretary.

DIVERTICULUM OF THE GALLBLADDER

(Continued from Page 209)

therefore, removed. Drain was inserted lateral to the incision.

Fluids were given subcutaneously and per rectum following the operation until liquids could be taken by mouth and recovery was uneventful. The accompanying illustration is a photograph of the removed gallbladder showing the diverticulum at the fundus of the bladder and the gallstone which was present in the cystic duct.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

The Pelvis in Obstetrics. Julius Jarcho, M.D., F.A.C.S. Consulting gynecologist, Hastings Hillside Hospital, etc. 365 pages. Illus. Price, $6.00, cloth. New York: Paul B. Hoeber, Inc., 1933.

Chronic Arthritis and Fibrositis. Bernard Langdon Wyatt, M.D., F.A.C.P. Director, The Wyatt Clinic, etc. 201 pages. Illus. Price, $3.50, cloth. Baltimore: Wm. Wood & Company, 1933.

Calcium Metabolism and Calcium Therapy. Abraham Cantarow, M.D. Instructor in Medicine, Jefferson Medical College, etc. 252 pages. Price, $2.50, flexible binding. Philadelphia: Lea & Febiger, 1933.

The History of Dermatology. Wm. Allen Pusey, A.M., M.D., LL.D. Professor of Dermatology Emeritus, University of Illinois, etc. 223 pages. Illus. Price, $3.00, cloth. Springfield, Illinois: Charles C. Thomas, 1933.

CLINICAL DIETETICS; A TEXTBOOK FOR PHYSICIANS, STUDENTS, AND DIETITIANS. Harry Gauss, M.S., M.D., F.A.C.P. 490 pages. Illus. St. Louis. Mosby, 1931.

This is a rather interesting text dealing with the problems of diet. There is a brief historical sketch, followed by a reasonable classification of foods and diets, and a brief study of digestion.

There are numerous diet tables for special conditions, with many sample diets. No especially new information is included in the text, but it can well serve as a reference book and should be especially useful to those engaged in compiling diet lists. It should also improve the physician's knowledge of dietary principles.

L. R. Critchfield, M.D.

OFFICE SURGERY — Fenwick Beekman, M.D. 402 pages, 94 illus. (Everyday practice series—Edited by Harlow Brooks, M.D.) Price: $5.00. Philadelphia and London; J. B. Lippincott Co., 1932.

This is the tenth volume in this series, designed to "furnish the reader with usable, modern, authoritative monographs" on various practical subjects. It is written conservatively and one of its best features is the frequent reference to the necessity for hospitalization in cases beyond the scope of office treatment. On the other hand, it contains much useful information which should prove of practical value to those who are interested in doing such surgery as can be properly undertaken in the office. Appropriately one-fourth of the book is devoted to the various infections encountered in office practice and the section on fractures is especially well done.

Diagnosis throughout is emphasized and good judgment has been used in the selection of methods of treatment advised.

Gilbert Cottam, M.D.